Vol. 1011 Number 4

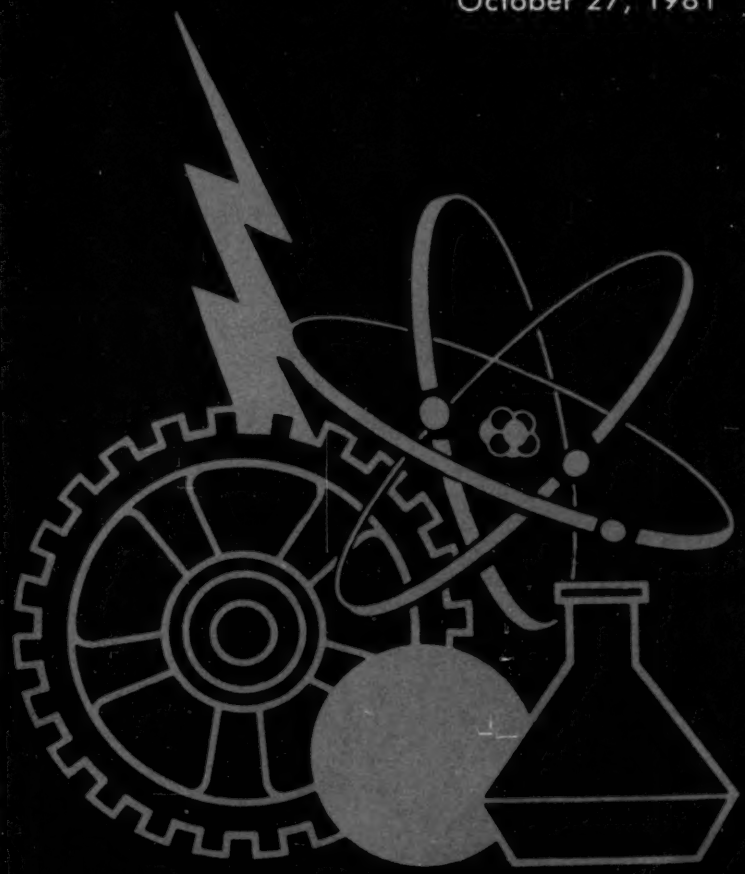
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 27, 1981



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 27, 1981 Volume 1011 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly, subscription $325.00 per annum for first-class mailing, also available as fourth-class mail at $225.00 domestic; $281.25 foreign; foreign first-class mailing rates will be furnished upon request; single copies each, $5.50 domestic, $6.90 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $105.00 per annum, foreign mailing $131.25 per annum; single copies $2.75 each domestic, $3.45 foreign.

GENERAL INFORMATION concerning PATENTS, price $2.25 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.70 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,621,323, Re. S.N. 269,599, Filed June 2, 1981, Cl. 313/317, COATED INCANDESCENT ELECTRIC LAMP, William R. Tooke, Jr., Owner of Record: *Thomas Manufacturing Co., Parkton, Md.,* Attorney or Agent: A. W. Breiner, Ex. Gp.: 256

4,156,973, Re. S.N. 270,420, Filed June 3, 1981, Cl. 34/86, HEATING VENT FOR ELECTRIC CLOTHES DRYER, James D. Bede, Owner of Record: *Bede Industries, Inc., Bay Village, Ohio,* Attorney or Agent: Charles B. Lyon, et al., Ex. Gp.: 344

4,174,281, Re. S.N. 282,001, Filed July 10, 1981, Cl. 210/786, COUNTERCURRENT DECANTATION, Christoper C. Dell, Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: None, Ex. Gp.: 176

4,216,062, Re. S.N. 254,250, Filed April 15, 1981, Cl. 202/248, SEALING MEANS FOR A COKE OVEN CHUCK DOOR, Calvin E. Kelly, et al., Owner of Record: *United States Steel Corp., Pittsburgh, Pa.,* Attorney or Agent: William F. Riesmeyer, III, Ex. Gp.: 177

4,253,447, Re. S.N. 282,086, Filed July 10, 1981, Cl. 128/6, COLOR ENDOSCOPE WITH CHARGE COUPLED DEVICE AND TELEVISION VIEWING, William C. Moore, et al., Owner of Record: *Welch Allyn, Inc., Skaneateles Falls, N.Y.,* Attorney or Agent: Richard von K. Bruns, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

D. 233,463, Reexam. No. 90/000,063, Requested: Sept. 3, 1981, Cl. Dll/90, BEAD, Harold Roger, Owner of Record: *Inventor,* Attorney or Agent: Amster & Rothstein, Ex. Gp.: 292, Requester: Harold Mangelsen & Sons, Inc., c/o Henderson & Sturm, Omaha, Neb.

3,328,231, Reexam. No. 90/000,072, Requested: Sept. 18, 1981, Cl. 521/131, METHOD OF PRODUCING CAST SURFACES AND PRODUCTS OBTAINED THEREBY, John A. Sergovic, Owner of Record: *The Burns & Russell Co. of Baltimore City, Baltimore, Md.,* Attorney or Agent: Louis F. Reed, Ex. Gp.: 143, Requester: Trenwyth Industries, Inc., Emigsville, Pa.

3,817,333, Reexam. No. 90/000,074, Requested: Sept. 25, 1981, Cl. 172/283, PLOW SYSTEM WITH PLURALITY OF PLOW UNITS AND MEANS FOR ADJUSTING SPACING BETWEEN UNITS IN A CONTINUOUS MANNER, Jon E. Kinzenbaw, Owner of Record: *Dietrich Manufacturing, Inc., Goodfield, Ill.,* Attorney or Agent: James J. Hill, Ex. Gp.: 334 Requester: International Harvester Co., Chicago, Ill.

4,061,481, Reexam. No. 90/000,077, Requested: Sept. 30, 1981, Cl. 62/29, NATURAL GAS PROCESSING, Roy E. Campbell, et al., Owner of Record: *The Ortloff Corp., Midland, Tex., c/o Allan H. Bonnell, Esq.,* Attorney or Agent: Allan H. Bonnell, Esq., Ex. Gp.: 177, Requester: The Ortloff Corp., New York, N.Y.

DEPARTMENT OF COMMERCE

Patent and Trademark Office
AUTOMATION STUDY

Agency: Patent and Trademark Office, Commerce

Action: Request for Automation Technology Information

Summary: The Patent and Trademark Office requests information from firms which can provide applicable state-of-the-art technology to support automation in the areas of Patent Automation, Trademark Automation, Internal Operations, Public/Office Communications, and Printing. Such firms should provide sufficient information to allow the Patent and Trademark Office to assess the capability of the technology to meet the requirements which will be established. Such automation efforts are intended to modernize the PTO's patent, trademark, information dissemination, printing, and administrative management programs. This information should be limited to fifteen (15) pages or less and specifically address the type of support (hardware or software) offered, the programs to be supported, and how the support would be applied. If deemed appropriate, the information provided will be included in the final report of the study required by Section 9 of P.L. 96-517, which study must be submitted to the Congress on or before December 12, 1982. Proprietary information should not be submitted.

Date: Information must be submitted on or before Nov. 6, 1981.

Address Information to:
Commissioner of Patents and Trademarks
Washington, D.C. 20231
ATTN: James A. Green

For Further Information Contact: James A. Green by telephone at (703) 557-1610 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplemental Information: Section 9 of P.L. 96-517, which is the basis for the development of the automation plan, states:

"Sec. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act [Dec. 12, 1980], a plan to identify and if necessary develop or have developed computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future."

During the development of the automation plan, analyses of the current state-of-the-art in a wide variety of technological areas will be conducted. The technology which will be addressed includes all types of software for search, retrieval and processing large text data bases, and hardware for mass data storage, text retrieval systems, image enhancement and retrieval, engineering graphics, optical character recognition, automated photocomposition, electronic facsimile transfer, and source data automation.

Oct. 7, 1981. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Oct. 8, 1981. ROBERT B. ELLERT,
Acting Assistant Secretary for Productivity, Technology and Innovation.

DEPARTMENT OF THE TREASURY
UNITED STATES CUSTOMS SERVICE
(TMK-2-CO:R:E:E)

Notice of Application for Recordation of Trade Name "BULGARI"

Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "BULGARI" or printed with a Roman u *i.e.*, "BULGARI", used by Ditta Sotirio Bulgari di Constantino e Giorgio Bulgari S.A.S., a partnership organized under the laws of Italy, located at 10 Via dei Condotti, Rome, Italy.

The application states that the trade name is used in connection with a wide variety of fine watches, jewelry, ornamental works and artwork made of precious metal and precious or semi-precious stones and various other items made of precious metals, manufactured in Italy. The application states further that Bulgari Distribuzione S.P.A., 6 Via Gregoriana, Rome, Italy and Bulgari S.P.A., 10 Via Dei Condotti, Rome, Italy are authorized to use the trade name. Appropriate accompanying papers were submitted with the application.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person, in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received no later than 30 days from the date of publication of this notice in the Federal Register.

Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Sept. 15, 1981. A. PIAZZA,
Acting Director, Entry Procedures and Penalties Division.

Patent and Trademark Office

Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on November 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after November 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of November 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after November 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and International Affairs
Box 4
U.S. Patent and Trademark Office
Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

Date: Oct. 15, 1981. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 27, 1981

Re. 30,610	4,260,371	4,272,999	4,279,986
Re. 30,635	4,260,892	4,273,176	4,280,073
3,624,205	4,260,960	4,273,300	4,280,332
3,730,185	4,261,285	4,273,357	4,280,370
3,783,976	4,262,115	4,273,661	4,280,384
3,897,238	4,262,657	4,274,053	4,280,476
4,142,837	4,263,251	4,274,262	4,280,688
4,150,864	4,263,494	4,274,332	4,280,898
4,170,818	4,264,201	4,274,598	4,281,426
4,179,602	4,264,495	4,274,814	4,281,627
4,183,040	4,264,682	4,274,979	4,281,658
4,184,489	4,264,685	4,275,062	4,281,717
4,185,709	4,265,305	4,275,347	4,281,884
4,195,157	4,265,977	4,275,524	4,282,043
4,201,560	4,266,067	4,275,582	4,282,096
4,205,561	4,266,747	4,275,964	4,282,379
4,214,157	4,267,039	4,276,066	4,282,483
4,218,267	4,267,107	4,276,071	4,282,622
4,227,439	4,267,167	4,276,428	4,282,719
4,228,580	4,267,344	4,276,431	4,282,908
4,230,970	4,267,619	4,276,887	4,282,932
4,231,158	4,267,824	4,277,207	4,282,934
4,231,662	4,267,999	4,277,250	4,283,306
4,233,182	4,268,777	4,277,286	4,283,516
4,233,303	4,268,789	4,277,508	4,283,660
4,233,620	4,268,827	4,277,531	4,283,832
4,237,764	4,269,556	4,277,612	4,284,259
4,243,925	4,269,988	4,277,613	4,284,479
4,245,047	4,269,995	4,277,893	4,284,694
4,246,077	4,270,038	4,277,913	4,284,806
4,249,132	4,270,269	4,278,071	4,284,812
4,251,636	4,270,921	4,278,161	4,284,936
4,253,252	4,271,312	4,278,367	4,284,992
4,253,760	4,271,605	4,278,564	4,285,420
4,254,848	4,272,106	4,278,565	4,285,424
4,255,323	4,272,185	4,278,812	4,285,589
4,256,650	4,272,289	4,278,815	4,285,986
4,257,164	4,272,357	4,279,017	4,286,039
4,257,601	4,272,409	4,279,287	4,286,082
4,257,874	4,272,469	4,279,432	
4,259,674	4,272,986	4,279,836	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-09-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-12-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-06-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director ..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-23-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-20-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	2-08-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-12-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	2-19-80

Expiration of patents: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive

REISSUES

OCTOBER 27, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,782

METHOD FOR THE MANUFACTURE OF AN ELECTRET FIBROUS FILTER

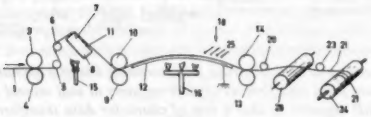
Jan van Turnhout, Delft, Netherlands, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Original No. 3,998,916, dated Dec. 21, 1976, Ser. No. 561,872, Mar. 25, 1975. Application for reissue Jul. 31, 1978, Ser. No. 929,680

Claims priority, application Netherlands, Mar. 25, 1974, 7403975

Int. Cl.[3] **B29D** *27/00*

U.S. Cl. 264—22 **48 Claims**



1. A method for the manufacture of an electrically charged fibrous filter from a high molecular non-polar material, comprising the steps of:

continuously feeding a film of high molecular isotactic polypropylene material at a rate of 12.2 meters per minute;

stretching said film in two stages, said first stage of stretching stretches said film at a ratio of 1:6 at a temperature of approximately 110° C., said second stage of stretching stretches said film at a ratio of 1:1.5 at a temperature of substantially 130° C.;

homopolarly charging at least one side of the stretched film with a plurality of corona charging elements, said plurality of corona discharge elements being connected to minus 10 KV, said step of charging including the use of a metal plate connected to an opposite polarity voltage source and a grid whereby said charging corona elements are between said metal plate and said film, said metal plate being connected to a voltage of plus 3 KV, said grid being connected to a voltage of minus 2.3 KV, said corona charging elements being spaced substantially 5 mm from the means for supporting said film during said second stage of stretching;

fibrillating the charged film into fiber material; *and*

collecting the fiber material [; and processing the collected fiber material into a filter] *to form a filter.*

10. A method for the manufacture of an electrically charged fibrous filter from a highly molecular non-polar material, comprising the steps of:

continuously feeding a film of said material;

heating said film

stretching said film along the longitudinal axis thereof as defined by the path of movement of said film;

homopolarly electrically charging at least one side of said film;

fibrillating the charged film into fiber material; and

collecting the fiber material to form a filter.

Re. 30,783

FLAME RETARDING LINEAR POLYESTERS AND SHAPED ARTICLES THEREOF

Hans-Jerg Kleiner, Kronberg; Manfred Finke, Fischbach; Ulrich Bollert, Diedenbergen, and Walter Herwig, Neuenhain, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

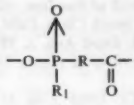
Original No. 3,941,752, dated Mar. 2, 1976, Ser. No. 505,686, Sep. 13, 1974. Continuation of Ser. No. 880,866, Feb. 23, 1978, abandoned. Application for reissue Feb. 11, 1980, Ser. No. 120,465

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1973, 2346787

Int. Cl.[3] **C08G** *63/76*

U.S. Cl. 528—287 **13 Claims**

1. A linear polyester which is the polycondensation product of a dicarboxylic acid, a diol and a flame-retarding carboxyphosphinic acid monomer, said monomer being used in an amount of from 3 to 20 mol percent, based on the total amount of dicarboxylic acid and monomer, said monomer being a source of structural units in said polyester of the formula



wherein R is saturated, open-chain or cyclic alkylene, arylene or aralkylene having one to 15 carbon atoms, and may contain one or more hetero atoms selected from F, Cl, Br, O and S, and R_1 is alkyl having up to six carbon atoms, aryl, or aralkyl and may contain one or more hetero atoms selected from F, Cl, Br, O and S, provided that in the R and R_1 groups the O, if present, is the oxygen of an ether group, and the S, if present, is the sulfur of a thioether, sulfoxide, sulfone or sulfonate group.

Re. 30,784

GROUP OPERATED CIRCUIT DISCONNECT APPARATUS FOR OVERHEAD ELECTRIC POWER LINES

Ronald P. Bridges, 9 S. 681 Brookeridge Rd., Downers Grove, Ill. 60515

Original No. 4,095,061, dated Jun. 13, 1978, Ser. No. 783,940, Apr. 1, 1977. Application for reissue Aug. 20, 1979, Ser. No. 68,474

Int. Cl.[3] **H01H** *31/00*

U.S. Cl. 200—48 KB **16 Claims**

15. A group operated electric circuit disconnect apparatus for a plurality of overhead electric power distribution lines carried on poles, said apparatus comprising, in combination:

a base adapted to be mounted adjacent the top of a pole;

a first disconnect switch surmounting the base;

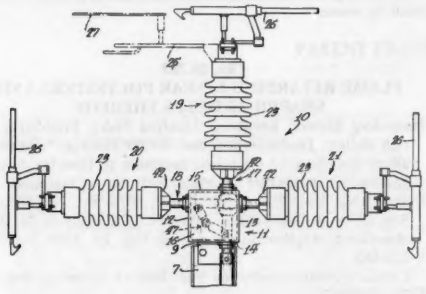
second and third disconnect switches mounted at opposite sides of the base;

an upright shaft means journalled on said base, said upright shaft means being operatively connected to said first switch so that axial rotation of the shaft means opens and closes the first switch;

transverse shaft means journalled on said base and operatively connected to said second and third switches so that axial rotation of said transverse shaft means opens and closes said second and third switches;

means on one of said shaft means to which a rotational force may be applied to rotate said one of said shaft means axially;

and a mechanical connection between said upright shaft means and said transverse shaft means so that axial rotation of said



one of said shaft means causes axial rotation of the other of said shaft means.

Re. 30,785

MICROCOMPUTER TERMINAL SYSTEM

Lawrence R. Lovercheck, Palo Alto; Russell K. Hileman, and Richard W. Calfee, both of San Jose, all of Calif., assignors to Zentec Corporation, Santa Clara, Calif.

Original No. 3,973,244, dated Aug. 3, 1976, Ser. No. 553,654, Feb. 27, 1975. Application for reissue May 18, 1979, Ser. No. 40,140

Int. Cl.[3] **G06F** *3/00, 3/153*

U.S. Cl. 364—200 **31 Claims**

1. An information terminal system comprising:

a. a memory storing character data;

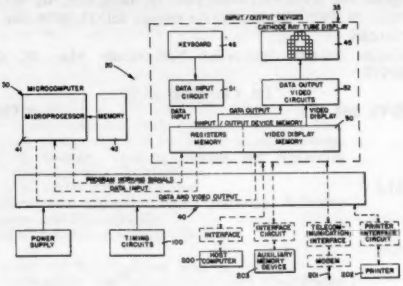
b. data means for entering character data into said memory;

c. a first set of shift registers receiving character data from said memory for storage therein;

d. a second set of shift registers receiving character data from said first set of shift registers for storage therein;

e. video circuit means receiving *successive rows of* character data from said second set of shift registers for producing video signals; [and]

f. means including a character display receiving said video signals from said video circuit means for displaying [a character element] *successive rows of characters corresponding to said successive rows of character data; and*



g. timing and control means for controlling transfer of character data from said first set of shift registers to said second set of shift registers so that a row of character data transferred to said second set of shift registers causes said video circuit means to produce video signals that produce a display of a row of characters in said character display while the succeeding row of character data is received and stored in said first set of shift registers ready to be transferred to said second set of shift registers to produce video signals in said video circuit means for the succeeding row of characters displayed in said character display.

PLANT PATENTS

GRANTED OCTOBER 27, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,781
BEGONIA PLANT

James C. Mikkelsen, and Cornelis P. Van den Berg, both of Ashtabula, Ohio, assignors to Mikkelsens Inc., Ashtabula, Ohio

Filed Mar. 25, 1980, Ser. No. 133,900
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant referred to by the cultivar name Fresco, as described and illustrated, and particularly characterized by its large semi-double to double, deep orange-red flowers; heavy infusion of red pigmentation in the foilage; pleasant contrast of flower and foliage color; year round flowering with proper environmental conditions, and by its vigorous growth habit.

4,782
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,076
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinctive cultivar of African Violet plant known by the cultivar name Glacier, as described and illustrated, and particularly characterized by its large white, star-shaped flowers having five to eight petals; strong and upright flower stems; heart-shaped leaves, vigorous growth habit, and by its long lasting, non-dropping flowers.

4,783
CARNATION PLANT

Jack M. Meek, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 5, 1980, Ser. No. 175,421
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—72 **1 Claim**

1. A new and distinct cultivar of carnation known by the cultivar name Duchess, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of commercial double flower type; flat flower form, twisting slightly with maturity; medium flower size, dark salmon pink flower color with minimum color oxidation; medium flowering response; 4 to 7 flowers and buds showing color per flowering stem; medium peduncle length; strong peduncle strength; and tall plant height.

PATENTS

GRANTED OCT. 27, 1981

ERRATA

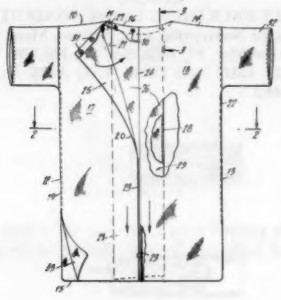
For CLASS	See PATENT NO.
474–262	4,296,640
294–144	4,296,880
501–002	4,297,139
428–310	4,297,140
501–067	4,297,141
501–077	4,297,142
501–103	4,297,143
376–103	4,297,165
376–194	4,297,166
376–273	4,297,167
376–418	4,297,168
376–418	4,297,169
376–442	4,297,170
376–440	4,297,171
136–256	4,297,391
028–042	4,297,403
030–215	4,297,432

PATENTS

GRANTED OCTOBER 27, 1981

GENERAL AND MECHANICAL

4,296,497
HOSPITAL PATIENT GOWN
Seymour S. Herman, New York, N.Y., assignor to Stan Herman Studio, Inc., New York, N.Y.
Filed May 16, 1980, Ser. No. 150,324
Int. Cl.³ A41B 9/00
U.S. Cl. 2—114 **5 Claims**



1. A hospital patient gown comprising a front panel, a first and a second rear panel, longitudinal side margins on each of the said panels, means to secure the front panel and side panels together to form a gown having an elongated vertical rear opening therein, a neck band on said panels, a free portion on the first and the second rear panel, an inverted pleat on one of said free portions said pleated portion extending across the rear opening and underlying the other free portion and means carried by the neck band and pleated portion to secure the rear panels together.

4,296,498
REVERSIBLE GARMENT
Joseph J. Vinson, 2009 Blossom La., Marshalltown, Iowa 50159
Filed Jun. 2, 1980, Ser. No. 155,417
Int. Cl.³ A41B 1/00
U.S. Cl. 2—115 **3 Claims**

1. A reversible garment such as a jersey or the like for the upper part of the body, comprising:

(a) a front and back panel joined together at seams having sleeves and a neck opening that form a pullover upper-body garment,

(b) said front panel having an identifying characteristic different from the back panel,

(c) said front and back panels being of substantially the same size and shape,

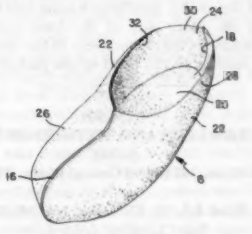
(d) a reversible flap having cutouts for said sleeves and conforming in size and shape to said front and said back panel and having side and bottom edges.

(e) said flap being permanently affixed to said garment so as to be selectively movable from a position over either the entire front panel or the entire back panel to cover the identifying characteristics of one of said panels when moved into a panel covering position,

(f) said flap having different identifying characteristics on its opposite sides which characteristics correspond to those contained on the front and back panels so that the same identifying characteristics will be displayed on the front and the back of the garment simultaneously regardless of the selected position of the flap, and

(g) a first and a second fastening means for securing the side edges of the flap in one of said selected positions over at least one of said panels.

4,296,499
BLISTER PREVENTING FOOT COVER
Theodore P. Patterson, 5207 Twilight La., Fort Wayne, Ind. 46815, and Stephen E. Winner, Fort Wayne, Ind., assignors to Theodore P. Patterson, Fort Wayne, Ind.
Filed May 29, 1979, Ser. No. 43,459
Int. Cl.³ A41B 11/00
U.S. Cl. 2—239 **5 Claims**



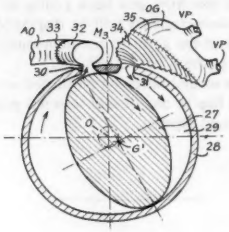
1. A method for the prevention of blisters on the feet comprising:

providing a foot cover made of one or more porous, non-woven film-fibril sheets of plexifilamentary strands, said strands having about 200 to 800 point bonds per square inch comprising about 5 to 10 percent of the planar area of the sheet or sheets, and a plurality of minute perforations extending through the thickness of the sheet or sheets with the total cross-sectional area of the perforations being at least 3 percent of the planar area of the sheet or sheets, said sheet or sheets being formed into a foot enveloping shape comprising a bottom portion adapted to lie underneath the sole of the foot, side portions extending upwardly from the bottom portion and adapted to cover the sides of the foot, a heel portion adapted to cover the heel of the foot, and a front portion adapted to cover at least the forward portion of the top of the foot, said cover having a relatively smooth inner surface and a relatively rough outer surface; and placing and wearing the foot cover on the foot directly in contact with the foot and directly underneath an overlying sock such that the smooth inner surface contacts the foot and clings to it and prevents the formation of blisters and the relatively rough outer surface engages the sock and provides some stability with the overlying sock.

4,296,500
ARTIFICAL HEART

Jean R. Monties, Auriol, and Patrick J. C. Havlik, Marseilles, both of France, assignors to Agence Nationale de valorisation de la Recherche (ANVAR), France

Filed May 3, 1978, Ser. No. 902,364
Claims priority, application France, May 6, 1977, 77 14470
Int. Cl.³ A61F *1/24;* A61M *1/03*
U.S. Cl. 3—1.7 **10 Claims**

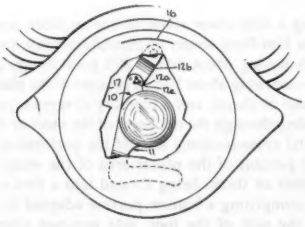


1. An artifical heart comprising a cylindrical rotor and a body which defines a cylindrical cavity, the cross-sections of said rotor and said cavity being respectively a trochoid and the envelope of said trochoid when the rotor is driven both in circular translation and in rotation about its centre, means for driving the rotor in rotation at a uniform speed, the number of revolutions per minute of which is the same as the ormal pulse rate of the patient, whereby the body has at least one fixed narrow region parallel to the generating lines within which the rotor is permanently in substantially tight contact with the inner wall of the cavity, said body having two elongated openings located on either side of the fixed region which are adapted to be connected respectively to the venous system and to an artery leading to the heart of the patient.

4,296,501
INTRAOCULAR LENS AND METHOD OF MAKING THE SAME

Charles D. Kelman, 269 Grand Central Pkwy., Floral Park, N.Y. 11005

Filed Jul. 14, 1980, Ser. No. 168,544
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **14 Claims**

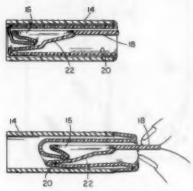


1. An intraocular lens suitable for use as an artificial lens implant anteriorly of the iris, the lens comprising:
a medial, light-focusing lens body; and
at least a pair of lateral position fixation elements connected with said lens body;
at least one of said pair of position fixation elements having a first portion contiguous to and extending generally laterally outwardly from a first region of the periphery of said lens body, and
the other of said pair of position fixation elements having a first portion contiguous to and extending generally laterally outwardly from a second region of the periphery of said lens body spaced from and generally opposite said first region and in a direction generally opposite to that of said first portion of said one position fixation element;
said other of said pair of position fixation elements having a second portion pivotable about the end of said first portion of said other of said pair of position fixation elements before being attached to said first portion of said other of said pair of position fixation elements at a selected position before implantation in the eye.

4,296,502
SELF-PACKAGING URINE CONDUIT

Bonnie Bortle, 62 Newtonville Ave., Newton, Mass. 02158

Filed Mar. 17, 1980, Ser. No. 130,738
Int. Cl.³ A61G *9/00;* E03D *13/00;* A47K *11/12*
U.S. Cl. 4—144.1 **6 Claims**



1. A self packaging urine conduit for women, comprising
a flexible and reversibly deformable fluid-tight tubular medial element, having a first portion of generally uniform inner dimension, and a second generally funnel-shaped portion continuous therewith and having an inner dimension increasing from that of said first portion to a rim dimension at its free edge,
a relatively rigid tubular end piece having an inner dimension approximately equal to that of said medial element first portion, said medial element first portion being connected to said tubular end piece to define at least one connecting area, said medial element first portion and said tubular end piece together forming a continuous fluid-tight channel,
a rim integrally connected to said medial element funnel-shaped portion at said free edge, said rim having an undeformed dimension greater than the inner dimension of said tubular end piece and being resiliently deformable to fit within said tubular end piece, and
a relatively rigid handle element integrally and rigidly connected to said rim and generally coplanar with said rim,
said medial element first portion having a length at least as great as the length of said tubular end piece,
said medial element first portion being reversibly inverted for storage of said rim, said handle and said funnel shaped portion within said tubular end piece.

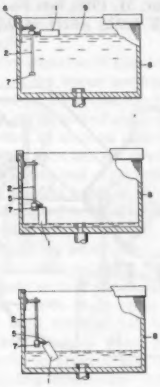
4,296,503
IN-TANK BATHROOM DEODORIZER/CLEANER

Anthony Leardi, Middletown, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 20, 1980, Ser. No. 122,970
Int. Cl.³ E03D *9/02*
U.S. Cl. 4—228 **1 Claim**

1. An in-tank toilet bowl cleansing and fragrancing device comprising a floatable container adapted to float on the surface of the water in a toilet bowl hold tank and to enclose a solid detergent material while leaving one of the surfaces of said solid detergent material exposed, means for securing said container in a toilet bowl hold tank with the exposed surface of the solid detergent out of contact with the body of water in the

tank, and means for causing said container to rotate between a substantially horizontal and a substantially vertical position as



the water level in the tank falls due to flushing and thereafter to return to the horizontal position as the water level recovers.

4,296,504

TOILET SEAT LOCK

Daniel C. Lawson, 6611 W. 174th St., Tinley Park, Ill. 60477

Filed Jul. 7, 1980, Ser. No. 166,160
Int. Cl.³ A47K *13/00*
U.S. Cl. 4—253 **10 Claims**

1. A device for use with a toilet and toilet seat cover comprising:

a lever adapted to fit through a hole in said toilet seat cover so as to allow rotation of said lever when said toilet seat cover is in a horizontal position;

a latch connected to said lever so that said latch will rotate in direct relationship to said lever and pivotally connected to said lever so that when said toilet seat cover is in a vertical position, said latch will lay substantially against said toilet seat cover and when said toilet seat cover is in a horizontal position, said latch will hang away from said toilet seat cover; and,

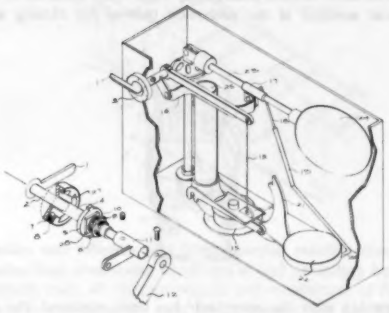
a retainer which is adapted to be affixed to said toilet and postioned so that when said toilet seat cover is in a horizontal position, rotation of said lever will allow rotation of said latch into or out from said retainer.

4,296,505

STEPLESS CONTROLLED FLUSH CLOSET

Chiang Chien-Sheng, 6, Alley 15, La. 174, Ta Tung St., Peitu District, Taipei, Taiwan

Filed Jan. 16, 1980, Ser. No. 112,467
Int. Cl.³ E03D *1/14, 3/12*
U.S. Cl. 4—324 **4 Claims**



1. A stepless controlled water tank for a flush toilet comprising a tank having at its bottom an outlet opening, a pivoted closure for said outlet opening, a pivoted control lever for releasably holding said closure in open position, a low level float connected with said control lever and acting by its flotation to position said control lever to hold said closure in open position when the water level is above a predetermined low level, an operating lever shaft rotatably mounted in said tank above normal high water level and extending to the outside of said tank, an operating handle outside said tank fixed to said shaft, an arm on said shaft inside said tank, linkage connecting said arm with said closure to open said closure by operation of said handle, whereupon said closure is held open by said control lever, a high level float on an arm pivotably mounted in said tank at approximately high water level, a slider slidable longitudinally on said float arm, lost-motion means connecting said slider with said control lever, volume discharge control means including a setting member on the outside of said tank, and means connecting said discharge control member with said slider to move said slides to different positions along said float arm, whereby said high water float, as it descends during discharge of water from said tank, acts through said slides and said means connecting said slides with said control means to release said closure to close said outlet at a time depending on the position of said slides on said float arm.

4,296,506

INVALID CHAIR

Neville Stoute, Sr., New York, N.Y., and Robert J. Pennise, Colmar, Pa., assignors to James A. Falborn and Richard M. Bird, both of New York, N.Y., part interest to each

Continuation-in-part of Ser. No. 99,187, Nov. 30, 1979, abandoned. This application Feb. 29, 1980, Ser. No. 126,147
Int. Cl.³ A47K *11/06;* A61G *7/02;* A47K *11/04*
U.S. Cl. 4—480 **14 Claims**

1. A replacement for a collapsible invalid wheelchair which comprises a left side frame member, a right side frame member and means effective between the frame members to hold them apart, said seat comprising:

a flexible padded seat member having a left side edge and right side edge for attachment to the left side frame member and the right side frame member respectively of an existing collapsible wheelchair, said seat member being formed with an elongated, generally rectangular opening extending substantially parallel to the left and right side edges of the seat member,

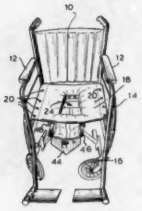
reinforcing means located within the seat member and at the

underside of the seat member respectively on each side of said opening;

means defining tracks on the underside of the seat member and extending substantially parallel to the left and right side edges of the seat member on each side of the opening;

a removable receptable adapted to fit slidingly in said tracks and extend over the full length of said opening; and

a detachable flexible padded flap removably attached to the seat member at the underside thereof for closing said



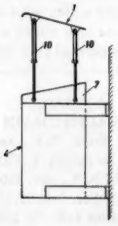
opening after the receptacle has been removed, the arrangement being such that the removal and attachment of the flap, and the insertion and removal of the receptacle can all be accomplished from the underside of the seat member, and such that upon removal of the receptacle the seat member can be folded about a line extending substantially parallel to the left and right side edges of the seat member without interference from the reinforcing means or the track defining means.

4,296,507

SAUNA HEATING UNIT AND SHIELD THEREFOR

Mats O. Janson, Port, Switzerland, assignor to Tylo Sauna S.A., Biel-Bienne, Switzerland

Filed Oct. 29, 1979, Ser. No. 89,135
Claims priority, application Sweden, Nov. 8, 1978, 7811514
Int. Cl.[3] A61H *33/06*
U.S. Cl. 4—524 **6 Claims**



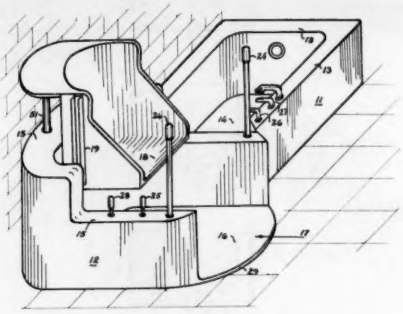
1. A sauna heating unit having a shield for guiding the stream of hot air from said unit into the sauna room comprising a substantially planar sheet member of heat resistant material detachably supported on the sauna heating unit in spaced relationship directly above it, upright members attached to said sheet member and said sauna unit to support said sheet member, said sheet being arranged at an angle to the horizontal plane for directing the stream of hot air from the sauna heating unit obliquely upwards into the sauna room, said sheet member having a shape and dimensions so that it covers an area corresponding to at least a substantial portion of the upper open end of the sauna heating unit.

4,296,508

BATHTUB FOR INVALIDS

Malachy J. Moran, 13915 Saratoga Rd., Saratoga, Calif. 94070

Filed Mar. 31, 1980, Ser. No. 135,393
Int. Cl.[3] A47K *3/022*; A61H *33/02*; A47K *3/12*
U.S. Cl. 4—540 **10 Claims**



1. A bathtub which can be entered without stepping over a sidewall and which provides for increased leg room during entry, the bathtub comprising:

a fixed part having a bottom closure, sidewalls extending upwardly on three sides from the bottom closure and having one open side, wherein the faces of the bottom closure and the two sidewalls along the open side form a portion of a concave cylindrical surface having a first radius about a first vertical axis;

an end part rotatable on a second vertical axis located on the bathtub centerline and having bottom closure, a back wall and two parallel sidewalls extending upwardly on three sides from the bottom closure, and having one open side, wherein the faces of the bottom closure and the two parallel sidewalls along the open side form portion of a convex cylindrical surface having a second radius about the first vertical axis; and

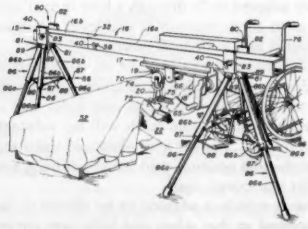
said end part being rotatably operable from a first position wherein the open side thereof faces away from the fixed part and provides an entrance to and exit the end part and a second position wherein the cylindrical faces of the rotatable end part and fixed part abut for providing a seal therebetween.

4,296,509

PORTABLE INVALID LIFT

Dwane P. Simmons, 7465 Olive Tree La., Highland, Calif. 92346, and Ray E. Lynn, 5172 Acacia St., San Bernardino, Calif. 92407

Filed Oct. 23, 1979, Ser. No. 87,343
Int. Cl.[3] A61G *7/08*
U.S. Cl. 5—81 R **1 Claim**



1. A portable apparatus for transferring an invalid from a

wheel chair to a bed or chair, and vice versa, said apparatus comprising:

an elongated track extending transversely over said bed or chair with one end projecting laterally from one side thereof with aligned holes at both ends of said track's vertical sidewalls;

first support means a tripod with telescoping legs, connected one to another on the upper portion thereof by a safety chain, said tripod set under the outermost portion of said laterally projecting section of said track, said tripod having a short section of channel open at the top mounted horizontally on the apex thereof in which the outer end of the laterally projecting end of said track section rests, said channel having aligned holes in its vertical sidewalls to line up with said aligned holes in said outermost portion of laterally projecting section of track to receive a locking pin, each said tripod leg being in two or more nearly equal sections with the lower sections being of a smaller size than the immediate section above and telescoping therein with each lower section on its upper end having a spring activated inset hard material ball on the outer surface thereof projected laterally when pulled clear by said spring sufficiently to prevent said immediate upper leg section from sliding downward thereon when said leg sections are extended, said ball also preventing said sections from extending downward accidentally when telescoped together by being projected laterally by said spring against the inner wall of said immediate upper leg section with sufficient pressure to cause enough friction to resist the force of gravity;

second support means a tripod identical to said first support means with an identical horizontal channel mounted at the apex thereof in which the outermost portion of the non-laterally projecting section of said track rests identically to said first support means and is secured identically to said first support means by an identical locking pin inserted through identical aligned holes in said channel's vertical sidewalls and aligned holes in the vertical sidewalls of said outermost portion of said non-laterally projecting section of track;

a wheeled carriage movable along the laterally projecting section of said track;

a winch with a rope depending therefrom mounted on said movable wheeled carriage;

a sling in which an invalid person sits; and

means on said rope attachable to said sling, said winch being operable to raise said invalid from said wheel chair or chair and to lower said person into said bed or chair or vice versa, said wheeled carriage being movable with said invalid between a first position on the laterally projecting portion of said track directly over said wheel chair, and a second position over said bed or chair.

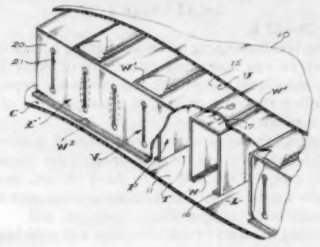
4,296,510

ANTI-SURGE FLOTATION MATTRESS

Raymond M. Phillips, 5500 W. 83rd St., Los Angeles, Calif. 90045

Filed Sep. 4, 1979, Ser. No. 72,126
Int. Cl.[3] A47C *27/08*
U.S. Cl. 5—450 **8 Claims**

1. A flotation mattress engageable in a frame having a horizontal platform and vertical side and end rails about and projecting upwardly from the platform; said mattress including an outer bladder of flexible, supple, water impervious sheet material with a flat, horizontal platform engaging bottom wall, vertical rail engaging side and end walls and a flat normally horizontal depressable top wall; a volume of fluid medium within and slackly filling the bladder; a normally flat, horizontal intermediate wall of flexible material in spaced relationship between the top and bottom walls and dividing the interior of the bladder into upper and lower portions; a plurality of spaced, vertical partitions of flexible, supple material fixed with and extending between the bottom and intermediate walls and cooperating therewith to define elongate fluid conducting tunnels with opposite ends in said lower portion of the bladder; flow metering fluid transfer means communicating with and between related ends of the tunnels; flotation means at the intermediate wall normally buoying up and maintaining that wall and the partitions in their normal position within the



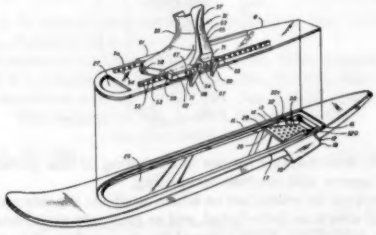
bladder and wherein said flow metering transfer means includes fluid conducting chambers at and extending between adjacent ends of adjacent tunnels and membranes of flexible material overlying the ends of the tunnels and having flow metering openings communicating with the tunnels and the chambers.

4,296,511

WATER SKI WITH INCREASED STABILITY

Joe B. Wright, 3728 Gratia Ave., Sacramento, Calif. 95821

Filed Jun. 8, 1978, Ser. No. 913,856
Int. Cl.[3] A63C *5/00, 15/06*
U.S. Cl. 9—310 A **24 Claims**



1. A water ski comprising:

a longitudinally and laterally extending member, said member having a front longitudinal end and a rear longitudinal end;

means for causing said member to lie in the water in the rest position with said front longitudinal end pointing upward and said rear longitudinal end pointing downward, said means comprising:

an aperture disposed in the lower surface of and situated toward said rear longitudinal end of said member;

a channel within said member communicating with said aperture; and

a vane pivotally mounted in said aperture for selectively inhibiting the flow of water through said aperture in a direction into said member.

4,296,512

METHOD FOR MAKING FASTENERS

William A. Kilinskas, Amherst; Ronald J. Selines, Yorktown Heights, and Jaak S. Vand den Sype, Scarsdale, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 9, 1979, Ser. No. 93,014
Int. Cl.[3] B21K 1/48
U.S. Cl. 10—27 E 9 Claims

1. A method for making a fastener having a head and a shank from wire or rod consisting essentially of AISI 200 or 300 series stainless steel comprising the following steps:

(a) cooling the wire or rod to a temperature of less than about minus 75° C.;

(b) drawing the cold wire or rod through a die at a strain sufficient to provide a tensile strength for the wire or rod in the range of about 75 ksi to about 160 ksi, the strain and the die size being such that the area of the wire or rod will be reduced by at least about 3 percent; and

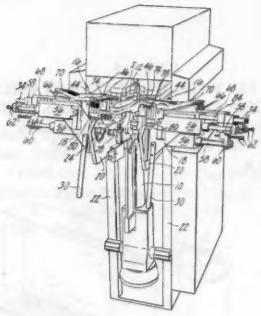
(c) dividing the wire or rod into slugs and cold heading each slug to provide the fastener.

4,296,513

SEAT AND WAIST LASTING MACHINE-INDEPENDENTLY PIVOTABLE SIDE LASTING FINGERS

David W. Halford; Frank C. Price, and George H. Bosworth, all of Leicester, England, assignors to USM Corporation, Farmington, Conn.

Filed Mar. 27, 1980, Ser. No. 134,459
Claims priority, application United Kingdom, Apr. 21, 1979, 13952/79
Int. Cl.[3] A43D 21/00
U.S. Cl. 12—12 16 Claims



1. A shoe machine for use in the lasting of side portions of shoe uppers, said machine comprising;

a support for a shoe last on which an upper, the side portions of which are to be lasted, and an insole are positioned, and a pair of side lasting assemblies arranged so as to act on opposite side portions of an upper placed on a last supported by said support;

each side lasting assembly comprising a plurality of wiping elements arranged side-by-side so as to engage a corresponding side portion of the upper along the length thereof;

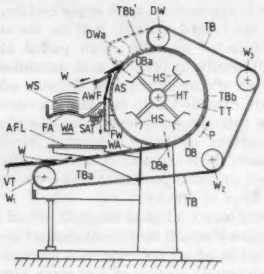
said wiping elements being movable inwardly so as to wipe the upper portion engaged thereby over the insole margin and to press it thereagainst, each element also being mounted for limited pivotal movement independently of the element adjacent thereto about a first axis extending transversely of the last bottom, and also about a second axis extending lengthwise of said last bottom, the arrangement being such that the distance between the second axis and the work-engaging surface of the element along a perpendicular to said surface passing through said second axis is generally equal to the distance between the first axis and a reference plane in which the second axis lies and which extends parallel to said first axis, along a perpendicular to said reference plane passing through said first axis.

4,296,514

METHOD FOR CONTINUOUS PROCESSING OF FLEXIBLE WORKPIECES

Jiri Dokoupil, Hochstrasse 9, 6251 Gückingen, and Kurt Hacker, Birkenwaldstrasse 155, 7000 Stuttgart 1, both of Fed. Rep. of Germany

Division of Ser. No. 904,496, May 10, 1978. This application Mar. 10, 1980, Ser. No. 128,977
Claims priority, application Switzerland, May 17, 1977, 6167/77; Fed. Rep. of Germany, Dec. 27, 1977, 2758349
Int. Cl.[3] A43D 9/00
U.S. Cl. 12—142 R 8 Claims



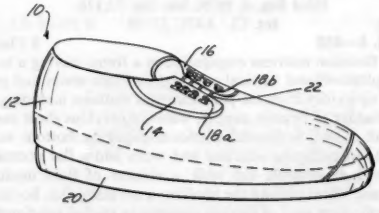
1. A method of continuous processing of laminar flexible workpieces, especially in leather, shoe or clothing production, with pressing, especially hot-press gluing of the workpieces, where the workpieces are carried through at least one pressure zone, characterized in that a continuous path of the workpieces comprises at least one low-pressure zone on the input side for spreading or smoothing the workpieces and at least one succeeding high-pressure zone for pressing the workpieces traversing the path from the input side in a generally upwardly direction toward an outlet side with an outlet motion of the workpieces essentially in the opposite direction to and spatially above the infeed motion of the workpieces.

4,296,515

FASTENING OF SHOE UPPERS FOR LASTING

John Hauser, Calle Chama, Qta. Tony, Colinas de Bello Monte, Caracas 101, Venezuela

Filed Jun. 9, 1980, Ser. No. 157,717
Int. Cl.[3] A43D 5/00, 9/00
U.S. Cl. 12—142 LC 6 Claims



1. A process for the temporary fastening of the flaps of a shoe upper prior to lasting of the upper, comprising aligning pairs of opposed eyelets formed in said upper, propelling fastening elements including a pair of substantially parallel legs and a bridging element extending between and connecting said

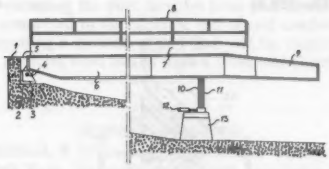
legs through said aligned eyelets such that one of said legs of each fastening element passes through both aligned eyelets following a path which is generally normal to the planes of said eyelets until it passes through the second of the aligned eyelets and then adopts a disposition generally parallel to said second eyelet, the legs of said fastening elements thereafter preventing separation of said flaps beyond a predetermined distance established by the length of the bridging elements.

4,296,516

VERTICALLY ADJUSTABLE BRIDGE FOR CONNECTION WITH SHIPS

Lennart Järnum, Helsingborg, Sweden, assignor to AB Jarnkonstruktioner, Helsingborg, Sweden

Filed May 30, 1979, Ser. No. 43,836
Claims priority, application Sweden, Sep. 6, 1978, 7809372
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.7 **10 Claims**



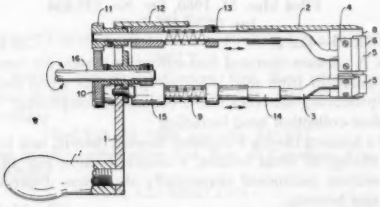
1. A vertically adjustable bridge for connection with ships comprising a plurality of bridge units, each bridge unit having a ramp including girders and an upper surface suitable as bedding for transport and a land side end rotatably connected to a permanently applied bearing arrangement, the other end of the bridge unit being adjustable to a desired height within a suitable adjustment range and being temporarily lockable in the adjusted position, supporting legs and locking means cooperating with the legs for locking the other end of the bridge unit in the adjusted position, the bridge units being mountable side by side adjacent one another, each bridge unit having straight sides parallel to one another, a raising and lowering arrangement including the supporting legs with fittings located under the ramps of each unit at suitable distances from both ends of the ramp and from its side edges in such a way that a plurality of units, which are individually maneuverable, can be adjusted, when necessary, at the same height close to one another, to effectively widen the bridge.

4,296,517

PORTABLE SPINNERET CLEANER

Joachim Böhler, Grosswallstadt, and Hans Jordon, Rudenau, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 17, 1979, Ser. No. 85,839
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 7832006[U]
Int. Cl.³ B08B *13/00*
U.S. Cl. 15—93 R **3 Claims**



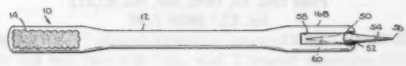
1. A portable spinneret cleaning unit, comprising: a base plate; an essentially cylindrical housing mounted on said base plate, said housing having a plane striker face at its free end; at least two guide bars, and means for mounting said guide bars on said housing whereby said guide bars pivot about and move linearly along their axis; mountings on the free end of said guide bars to receive at least one blade, the cutting edge of said blade being aligned parallel with the free end of said housing; spring means mounted on said housing for yieldably urging said blade slightly above said striker face; and means for rotating at least one guide bar.

4,296,518

TOOTHBRUSH AND GUM MASSAGING ACCESSORY

Joseph P. Furrier, Northvale, and Allan H. Gilbert, Oradell, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 30, 1979, Ser. No. 99,343
Int. Cl.³ A61H *13/00*
U.S. Cl. 15—110 **4 Claims**



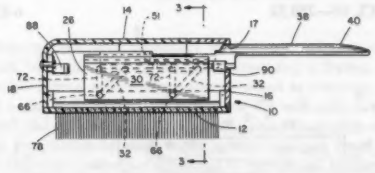
1. In a toothbrush including a handle and an array of bristles affixed to one end portion of said handle, an improvement comprising a gum massaging accessory movably secured to an opposite end portion of said handle for articulation between a first position in general alignment with said handle to at least a second position askew to said handle, said handle including a recess, said accessory including a resilient member terminating in a free-end portion for gum massaging treatment and an opposite end portion arranged in said recess, and pivot means for movably interconnecting said opposite end portion of said resilient member to said handle in said recess, said pivot means including a generally spherical-like socket, said free-end portion of said resilient member including a generally spherical-like region constrained in said socket for movement between said first and second positions.

4,296,519

BRUSH

Wilhelm E. Schmitt, Bensenville, Ill., assignor to Jack S. Friedman, Highland Park, Ill.

Continuation of Ser. No. 933,641, Aug. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 782,176, Mar. 28, 1977, abandoned, and Ser. No. 802,793, Jun. 2, 1977, abandoned.
This application Nov. 1, 1979, Ser. No. 90,101
Int. Cl.³ A46B *9/10*
U.S. Cl. 15—184 **16 Claims**



1. A brush having retractable bristles comprising:

(a) a casing defining an arcuate panel having a plurality of openings therein,

(b) a cradle member positioned in the casing, said cradle carrying a plurality of elongate support members rotatable with respect to the cradle member,

(c) a plurality of bristles mounted on the elongate support members, with each of the bristles extending into one of the openings in said panel in a close fitting relationship, and

(d) means to retract the bristles into the casting through the openings, said means including a wing member mounted for sliding movement within the casing, said wing member having cam slots therein, said cradle member being mounted in the casing and having follower means thereon engaging said cam slots whereby advancing the wing member in one direction within the casing operates to retract the bristles into the casing through the openings, thereby causing the elongate support members to rotate relative to the cradle and thereby prevent the bristles from being subjected to excessive deformation while the openings exert a cleaning action on the bristles to clean foreign matter therefrom, and advancing the wing member in the opposite direction within the casing operates to extend the bristles from the casing.

4,296,520

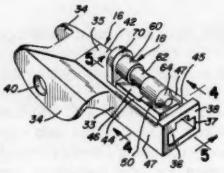
PIN CONNECTOR

John J. Arndt, Chesterton, Ind., assignor to The Anderson Company of Indiana, Gary, Ind.

Filed Oct. 10, 1979, Ser. No. 83,512

Int. Cl.³ B60S *1/40*

U.S. Cl. 15—250.32 **6 Claims**



1. A pin **(18)** having a cylindrically-shaped body portion **(60)** for attaching an adaptor **(16)** to a wiper blade **(10)**, said body portion **(60)** having an annular recessed midportion **(62)**, a head **(70)** on one end of said pin **(18)** extending radially outward from said body portion **(60)**, and a pair of spaced apart tabs **(72)** lying in the plane of said head **(70)** and extending parallel to each other in an outward direction from said body portion **(60)** for retaining said pin **(18)** on said adaptor **(16)** prior to use.

4,296,521

WIPER BLADES

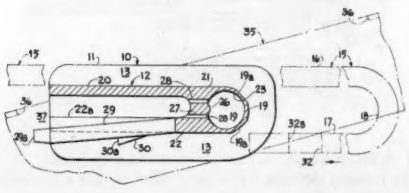
Peter Mower, Twickenham, England, assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Feb. 6, 1980, Ser. No. 119,127

Claims priority, application United Kingdom, Feb. 13, 1979, 5036/79; Apr. 4, 1979, 11853/79

Int. Cl.³ B60S *1/40*

U.S. Cl. 15—250.32 **6 Claims**



1. A connecting clip assembly for connecting a wiper arm to a wiper blade, said wiper blade having between its ends an opening with opposite parallel side walls for receiving the connecting clip and the arm for pivotal movement therebetween, and a first pair of aligned holes in said opposite parallel side walls, the connecting clip comprising an elongate unitary body forming a pair of opposite parallel external side faces, a portion for supporting an end portion of a wiper arm longitudinally of the connecting clip including means for retaining the end portion of the wiper arm, a transverse opening through said body at right angles to the side faces terminating in a second pair of aligned holes through the side faces, and a separable pin of a length greater than the distance between the side faces extending through said first and second pairs of aligned holes and said transverse opening in assembled position, interlocking, cooperating abutment means on said body and said pin for retaining said pin in assembled position, the end portions of said pin pivotally engaging said first pair of aligned holes.

4,296,522

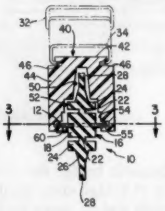
REVERSIBLE DUAL WINDSHIELD WIPER

Frederick Brack, 67 Pine St., Massapequa, N.Y. 11758

Filed Jun. 20, 1979, Ser. No. 50,474

Int. Cl.³ B60S *1/38*

U.S. Cl. 15—250.36 **4 Claims**



1. A revisible dual blade windshield wiper assembly comprising:

a blade holder formed of an elongated piece of material having upper and lower faces and substantially flat edge portions,

a flexible blade of elastomeric material extending from each of the faces of said blade holder, each of said blades having a base which is mounted to said blade holder and from which said blades extend; said blade holder spanning the entire base of each said blade and leaving a said edge portion thereof exposed on each side of each blade, each blade being of the same general shape,

an arm,

and a plurality of retaining clips mounted to said arm, each said retaining clip having a pair of legs which can be spread apart, a slot on the inner face of each of the legs of a said retaining clip in which the edge portions of the blade holder are placed.

4,296,523

DUST-COLLECTION HEAD FOR A DUST COLLECTION SYSTEM

William J. Clark, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1980, Ser. No. 135,834

Int. Cl.³ A47L *9/02*

U.S. Cl. 15—415 R **20 Claims**

16. A vacuum-operated dust-collection system for removing dust particles from dust-laden air produced when dumping dust-producing materials into a container, comprising:

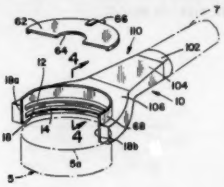
a dust-collection head including

(i) a housing having a chamber formed therein, said housing having an outer section, a central section and an inner section juxtaposed sequentially along one dimension of said housing,

(ii) a curved substantially C-shaped face formed in said outer section, said face have a plurality of parallel slots formed therein to extend generally along the length of said face,

the maximum distance across said face being approximately equal to that across the top of the container, and

(iii) a plurality of flow directors disposed within said chamber to extend inwardly from said face to a location spaced from but proximate to said central section to form a plurality of flow passages in said chamber so that a substantially even dust-capture velocity is provided along said face;



one end of a conduit means connected to said inner section for evacuating the dust particles from said chamber; and means connected to the opposite end of said conduit means for creating a vacuum at said face and for removing the dust particles from the air drawn from said chamber.

4,296,524

JOINING MEMBER

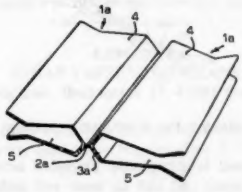
Anders Hörholt, 9 Avenue d'Ostende, Monte Carlo, Monaco, and Ulrik Kvist, Virvelvägen 42, 184 00 Åkersberga, Sweden

Filed Mar. 20, 1978, Ser. No. 888,399

Claims priority, application Sweden, Mar. 23, 1977, 7703319

Int. Cl.³ E05D 7/00

U.S. Cl. 16—150 **1 Claim**



1. A joining member for joining structure elements having plane connecting portions comprisng at least two profiles the cross-section of each of which is substantially U-shaped for receiving said plane connecting portions between the legs of said U-shaped profiles, said U-shaped profiles including a V-shaped bottom from the arms of which said legs extend, a thin web made in one and the same piece as said U-shaped profiles extending between the tips of each of said V-shaped bottoms articulatingly connecting said profiles, and said arms of said V-shaped bottom extending at a pre-determined angle from each of said tips, the degree to which adjacent of said U-shaped profiles are foldable about said web relative to each other being dependent upon the degree of said angle.

4,296,525

SWIVEL FITTING FOR FITTING PARTS OF A SAFETY BELT

Johann Schmid, Schwäbisch-Gmünd, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

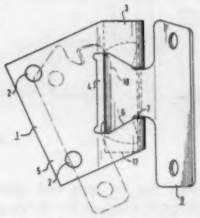
Filed Feb. 14, 1980, Ser. No. 121,473

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905863

Int. Cl.³ E05D 1/06

U.S. Cl. 16—174 **6 Claims**

1. Swivel fitting for fitting parts of a safety belt which are connectible together in a swivel relationship, comprising a first fitting part having a fitting portion and a cylindrically-shaped bearing eye integral therewith, said bearing eye having a cut-out formed therein with converging edges about said cylindrically-shaped bearing eye forming a wide part thereof disposed adjacent to said fitting portion and a narrow part thereof forming a centering slot centrally disposed in said cylindrical bearing eye, a plastic cylinder pin having a slot formed therein and being inserted in said bearing eye, a second fitting part having



a substantially T-shaped extension integral therewith with a center leg and two side legs, said T-shaped extension being radially insertable into said slot formed in said plastic cylinder pin through the wide part of said cutout formed in said bearing eye and said center leg thereof being swingable into the narrow part of said cutout formed in said bearing eye and lockable therein in the axial direction of said bearing eye in an operating position.

4,296,526

SKINNING MACHINE FOR THE HEADS AND LIMBS OF SLAUGHTERED ANIMALS

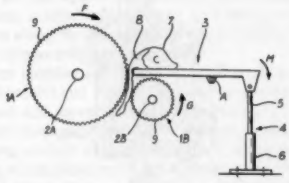
Claude Tournier, Lioujas, 12000 Rodez, France

Filed Dec. 4, 1979, Ser. No. 100,227

Claims priority, application France, Dec. 4, 1978, 78 34719

Int. Cl.³ A22B 5/16

U.S. Cl. 17—21 **3 Claims**

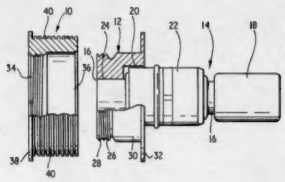


1. Skinning machine, especially for the external processing of a part of a slaughtered animal, comprising a frame, two parallel horizontal rolls rotationally mounted in bearings connected to the said frame, one at least of the said rolls being a drive roll, the rolls being sufficiently separated from each other at their peripheries to allow introduction between them of a flap of skin and to remove said skin by peripheral friction by rotation in opposite directions, a work table allowing support and maintenance of the part that is to be processed, said work table being movably mounted between a first position remote from the drive roll and a second position close to the drive roll with the drive roll being disposed in an extension of the said work table at a short distance from the end of the said table, such that a flap of skin extending over the said end of the table is gripped between the said end and the drive roll to thus initiate gripping of the skin by the drive roll, the second roll being disposed below the said table.

4,296,527
TEXTILE COMBING ROLLER

Brian K. M. Eadie, Johnstone, Scotland, assignor to Eadie Bros. & Co. Limited, Paisley, Scotland

Filed Apr. 19, 1979, Ser. No. 31,472
Int. Cl.³ D01G *19/10*
U.S. Cl. 19—112 **9 Claims**

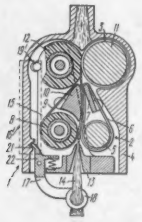


1. An opening roller for an open-end spinning apparatus comprising: a support part adapted for driving attachment to the spindle of the apparatus and a sleeve-like adapter constructed for releasable connection to said support part, said adapter having teeth secured to a cylindrical external surface thereof, providing the fibre engaging teeth of the roller, the releasable connection being such that it both establishes driving attachment of said adapter to said support part and secures said adapter on said support part without the intervention of a third element.

4,296,528
DRAWING MECHANISM

Gennady N. Shlykov, Chilanzar, kvartal 19, 31 kv. 3; Vitaly I. Zhestkov, Chilanzar, kvartal 19, 26, kv. 41; Valentin N. Tikhonov, ulitsa Shota Rustaveli, 55, kv. 28; Vasily M. Dyachkov, Kuiljuk - 4, 23-a, kv. 11; Vladimir G. Glazov, Chilanzar, kvartal 19, 58, kv. 25, all of Tashkent, and Timur P. Krjuk, prospekt Mira, 90, kv. 11, Moscow, all of U.S.S.R.

Filed Jun. 11, 1979, Ser. No. 47,054
Claims priority, application U.S.S.R., Jul. 13, 1978, 2643332
Int. Cl.³ D01H *5/88*
U.S. Cl. 19—255 **7 Claims**



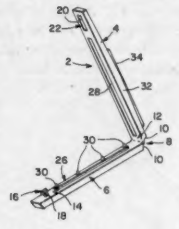
1. In an improved drawing mechanism embodying a ringless spinning frame comprising a housing accommodating therein a feed couple including two endless belts, one of said belts being mounted about a driving cylinder and adapted to move in engagement with a movable guide and to drive the other one of said two belts, mounted about the pressure roller of said feed couple and adapted to move in engagement with a stationary guide, and a delivery couple including its own driving cylinder and its own pressure roller adapted to pass therebetween a fibrous material coming from said feed couple, there being mounted at the inlet of said feed couple a guiding member and a compacting member adapted to effect the precompacting of the fibrous material being fed into said feed couple,

the improvement comprising mounting said pressure roller of said delivery couple, and the pressure roller of said feed couple jointly with the stationary guide and the respective belt thereof, the compacting member and the guiding member on a resiliently biased common removable plate which is associated with an adjustable means for retaining said removable plate in a required position; whereby said pressure rollers are uniformly urged against said driving cylinders, thereby providing improved driving conditions, and a handle for said drawing mechanism which when pulled disengages the adjustable means for retaining said removable plate in place.

4,296,529
BAG SEALING DEVICE

Stanley E. Brown, P.O. Box 69, Harriman, N.Y. 10926

Filed Jul. 11, 1979, Ser. No. 56,445
Int. Cl.³ B65D *77/10*
U.S. Cl. 24—30.5 P **8 Claims**



1. A closure device for temporarily sealing flexible bags comprising:

first and second longitudinally extended arms, each arm having an outer end and an inner end and at least one substantially flat inner surface, a hinge connecting said arms at the inner ends thereof, permitting said arms to pivot in one direction into stacked disposition with said inner surfaces disposed adjacent to each other,

a locking assembly disposed on said inner surfaces adjacent to the outer ends of said arms comprising an upwardly projecting male snap lock element located on the inner surface of one of said arms, and a female snap lock element disposed within the inner surface of the other of said arms, said female snap lock element comprising an opening defined primarily by parallel walls being adapted to receive and releasably engage said male snap lock element therein,

a clasping assembly located along said inner surfaces comprising an elongated longitudinal ridge extending along the inner surface of one arm and a longitudinal slot disposed matingly with said ridge along the opposite adjacent inner surface of the other arm, said slot extending only partially through said arm and being adapted to seat said ridge to crimpingly engage the entire girth of said bag,

longitudinally extending reinforcement means located on the outer surface of and being integral with the arm defining said slot being parallel to said slot to maintain the stiffness of said arm when said slot and said ridge engage the surface of said bag, and

release means located at the free end of one of said arms to disengage said locking assembly and release said bag.

4,296,530

CLAMP FOR TRIM STRIP

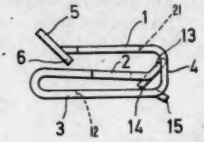
Klaus Muller, Weilhaltinger, and Gerhard Mack, Rheinfelden-Adelhausen, both of Fed. Rep. of Germany, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,747

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853254

Int. Cl.[3] E04F *19/02*

U.S. Cl. 24—295 4 Claims



1. A clamp for fastening trim or protective strips on a support surface having T-shaped studs mounted thereon, said studs having a head and a shank, said trim strip having an inwardly extending projection, said clamp being formed from a one-piece strip of sheet metal and having three spaced superposed legs, the middle one of said legs together with an outer one of said legs constructed to clamp said trim strip projection therebetween, the other of said outer legs being formed with a slot which receives the shank of said stud, said other outer leg and said middle leg clampingly engaging the top and bottom of the head of said stud, said outer legs being joined at the rear of said clamp across the width thereof, by a bridge, said middle leg being bent inwardly from the free end of said lower leg and extending towards said bridge and between said outer legs.

4,296,531

STRAP FASTENING MEANS

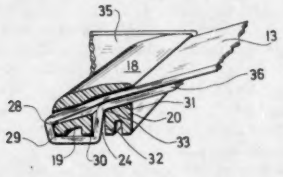
Sigurd W. Bengtsson, Bruksgatan 17, 41451 Gothenburg, Sweden

Filed Jun. 8, 1979, Ser. No. 46,702

Claims priority, application Sweden, Jun. 9, 1978, 7806704

Int. Cl.[3] A44B *11/25*

U.S. Cl. 24—200 5 Claims



1. A buckle for a strap comprising:

(a) a generally planar housing including a pair of oppositely located rectangular sidewalls, and at least three parallel bars extending between said sidewalls for the adjustable retention of the strap, said bars being arranged to provide

(b) a first strap passage having an entrance end through the endmost portion of said housing at the narrower ends of said rectangular sidewalls, and an outlet end disposed centrally of said rectangular sidewalls and opening within said housing into an enlarged recess within said housing between said rectangular walls, said first passage extending substantially in the direction of the longer sides of said rectangular sidewalls, said sidewalls and said recess defining an extension of said first strap passage within said housing beyond said outlet end, and said first passage being defined at one side by one of said bars and at its opposite side by two further ones of said bars, the side of said one bar remote from said first passage being an outside surface of the buckle, and

(c) a second strap passage having an external entrance end at one of said longer sides of said rectangular side-walls remote from the endmost portion of said housing and an outlet end opening into said first strap passage, and separating said two further bars and extending substantially parallel to said narrower ends of said rectangular side-walls.

4,296,532

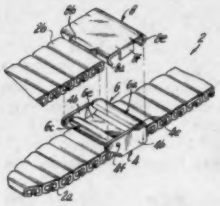
CLASP FOR WATCH STRAP

Kok-Kit Ho, Kam Tin, N.T., Hong Kong, assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 21, 1980, Ser. No. 132,486

Int. Cl.[3] A44B *21/00*

U.S. Cl. 24—206 R 5 Claims



1. A clasp construction for releasably connecting the ends of a bracelet together, comprising:

(a) an elongated U-shaped frame having a base plate and spaced upright walls along the sides thereof;

(b) a resilient spring plate mounted between the sidewalls of the frame in spaced relation above the base plate to define a longitudinal passage therebetween for receiving one end of the bracelet and shaped to clamp the bracelet end against the base plate at a selected position, said spring plate having a transversely-oriented hook-engaging surface at one end and a transversely-oriented cam engaging surface at the other end with a pressure surface therebetween to bear against said bracelet end for effecting said clamping action, said bracelet end being adjustable in position along the passage by sliding while the spring plate bias is temporarily released; and

(c) a cover member attached permanently at one end to the other bracelet end with at least one of said other bracelet end and said cover member end having a cam surface adapted to engage in snap-fit relation against the cam-engaging surface of said spring plate, said cover member having at the other end a hook surface adapted to engage around the hook-engaging surface of said spring plate, whereby said cover member is releasably attached to said spring plate by first engaging the hook and hook-engaging surfaces and then pressing down on the cover member to snap-fit the cam and cam-engaging surfaces together.

4,296,533

SNAP FASTENER COMPONENT STRIP

Randall H. Doerter, Meadville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Mar. 13, 1980, Ser. No. 129,912

Int. Cl.[3] A44B *17/00*

U.S. Cl. 24—216 5 Claims

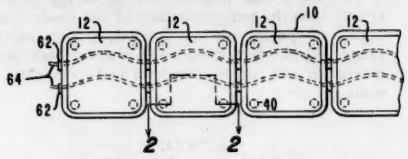
1. A snap fastener component strip particularly adapted for manipulation by automatic machinery comprising

a plurality of like plastic snap components aligned in a row,

a pair of integrally molded plastic connecting portions joining each pair of adjacent components, and

a pair of flexible reinforcing polymer filaments extending

along the row of snap components, a portion of each filament being embedded in each component,



said filaments having substantially greater flexibility than said molded connecting portions to maintain continuity between components even if said molded connecting portions are broken by flexure.

4,296,534

CLAMP FOR FLEXIBLE HOSES

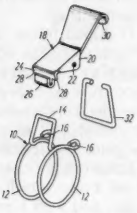
Kenji Nagano, Minoo, Japan, assignor to Osakasanko Kabushiki Kaisha and Kabushiki Kaisha Taiyohatsujyo Seisakusho, both of Osaka, Japan

Filed Feb. 12, 1980, Ser. No. 120,790

Claims priority, application Japan, Nov. 1, 1979, 54-151895[U]

Int. Cl.[3] **B65D** *63/00, 45/34;* **F16L** *33/00*

U.S. Cl. 24—270 **3 Claims**



1. A clamp for flexible hoses consisting of:

a clamping band formed by continuously winding a single springy metal wire to provide a pair of concentric circular rings partly overlapping each other to receive a hose and facing each other with a predetermined spacing therebetween, an inverted U-shaped rising bracket arm spanning the space between said circular rings at one of the respective ends of said rings, and a pair of eyelets formed by bending back the other ends thereof;

an operating lever of metal strip integrally formed with a hook at one end thereof, a pair of eyelets having insertion holes in a middle portion thereof, and a substantially inverted L-shaped finger rest at the other end thereof, said operating lever being mounted immediately above the overlap region of said circular rings with said hook being pivotally engageable with said bracket arm; and

a substantially U-shaped prop arm of metal wire pivotally supported at the upper end thereof in said insertion holes of said operating lever and at the lower end thereof in said eyelets of said circular rings, said prop arm being normally held in its rising position, the arrangement being such that by pressing said lever at said finger rest on its free end side downwardly against said circular rings of the clamping band, the opposite ends of the winding of the clamping band are forced to move away from each other under the resulting lever action, thereby contracting the diameter of the circular rings to clamp the hose.

4,296,535

APPARATUS FOR TEXTURIZING CONTINUOUS FILAMENTS

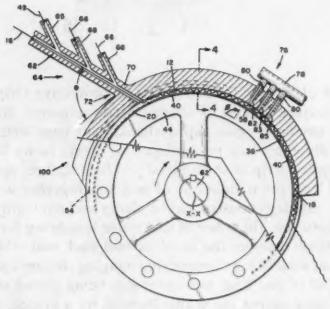
Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Alfred L. Liland, Lake Shawnee, all of N.J., assignors to Allied Chemical Coporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 799,066, May 20, 1977, Pat. No. 4,133,087, which is a continuation-in-part of Ser. No. 619,085, Oct. 2, 1975, Pat. No. 4,024,611. This application Jan. 8, 1979, Ser. No. 1,618

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.[3] **D02G** *1/12, 1/16*

U.S. Cl. 28—257 **10 Claims**



1. Apparatus for crimping continuous filaments comprising:

(a) a rotatable drum (**44**) having a peripheral recess (**42**) in which a screen (**17**), (**58**) forms a wall, said screen having a mesh size from 50 to 400 and being designed and constructed to permit escape of fluid therethrough to a discharge passageway (**56**), (**59**);

(b) a stationary cover (**34**) having a wall (**39**), (**60**) opposite to said screen, defining with said recess an arcuate chamber (**12**) through which chamber said screen in said recess continuously moves; said chamber having an inlet through the inlet tube (**35**), (**70**) specified below, and having an outlet opening (**18**);

(c) fluid directing means (**37**, **70**) comprising an inlet tube adapted to carry fluid and filaments therethrough and positioned with its discharge end in close proximity to a portion (**20**) of said screen which portion changes continuously as the periphery of the drum rotates, said inlet tube making an angle (θ) of 15° to 75° with the surface of said portion of the screen closely proximate to the discharge end of the inlet tube;

(d) a rear extension (**34**), (**54**) affixed to said cover to the rear of said inlet tube, positioned to prevent broken filaments or plugs thereof from re-entering said chamber after being moved to and emerging from the outlet opening thereof;

(e) heating means upstream of said inlet tube; and

(f) fluid jet heating means (**80**) disposed in said cover in communication with said chamber downstream from said inlet tube.

4,296,536

METHOD OF MANUFACTURING CARTRIDGE CASES

David W. Hicke, Joplin, Mo., assignor to Reagent Chemical and Research, Inc., Middlesex, N.J.

Filed Jul. 25, 1980, Ser. No. 172,391

Int. Cl.[3] **B21D** *51/54;* **B21K** *21/04;* **B23P** *15/22*

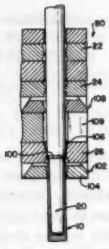
U.S. Cl. 29—1.3 **40 Claims**

1. A method of manufacturing cartridge cases comprising the steps of:

providing an initial workpiece having substantially flat upper and lower surfaces;

forming a cup-shaped article from said workpiece without any intermediate annealing operations during formation of such cup-shaped article, said formed cup-shaped article having a side wall, a bottom wall defined by inner and outer bottom wall surfaces, and an upper open end, said outer bottom wall surface of said cup-shaped article being formed from said substantially flat lower surface of said initial workpiece; and

engaging said formed cup-shaped article with a punch element and forcing said cup-shaped article through a series of die members to produce said cartridge case without annealing said cup-shaped article after passage through any of said die members, said punch element having an outer side wall and a bottom wall, said bottom wall of said punch element being dimensioned so that the diameter of the peripheral edge of said bottom wall is substantially the



same as the diameter of the peripheral edge of said inner bottom wall surface of said cup-shaped article whereby at least said peripheral edge of said bottom wall of said punch element will contact the peripheral edge of said inner bottom wall surface of said cup-shaped article when said punch element engages said cup-shaped article to thereby align said punch element and said cup-shaped article with one another for forcing said cup-shaped article through said series of die members, and the side wall of said punch element and said die members being of predetermined dimensions in relation to the dimensions of said cup-shaped article so that said cup-shaped article is only subjected to ironing during passage through said die members to thereby increase the length of the side wall of said cup-shaped article while reducing the thickness of the side wall of said cup-shaped article, and so that the thickness of said side wall of said cup-shaped article at a point adjacent the upper open end thereof is reduced during passage through said die members by at least 65%.

4,296,537

VARIABLE DEFLECTION ROLL CONTROLLED BY HYDRAULICALLY ACTUATED RECIPROCATING ELEMENTS

Eduard Küsters, Gustav-Fünders-Web 18, 4150 Krefeld, Fed. Rep. of Germany, and Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

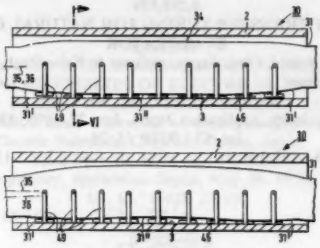
Filed Oct. 3, 1979, Ser. No. 81,327

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905542

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **5 Claims**

1. A hydraulically controlled variable deflection roll comprising a rotative shell having an external workrolling surface and a cylindrical inside, a fixed shaft extending through said inside with radial clearance permitting independent bending of the roll and shaft, said shaft having on one side a longitudinally extending series of blind bores extending radially into the shaft and containing reciprocating elements having outer sides connecting with bearing shoes bearing on the shell's said inside, and means for introducing hydraulic pressure behind said elements so that said shoes apply outwardly directed force to the shell's inside and stressing said shaft with force in a direction away from the shell's said inside on which said shoes bear,



said shaft, shaped so as to taper towards its ends and bulge toward its middle, whereby when said shaft is stressed by said force, its said side will form substantially a uniform clearance from the shell's said inside substantially throughout the extent of said series of elements.

4,296,538

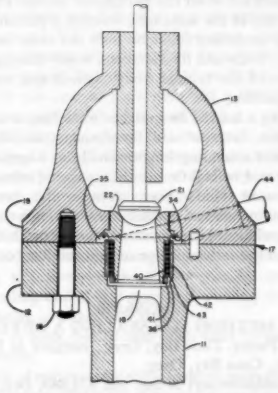
METHOD OF PROVIDING A SEALING ASSEMBLY BETWEEN A STEAM CHEST AND TURBINE CASING

William A. Straslicka, Norvelt, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 909,132, May 24, 1978, Pat. No. 4,219,201. This application Nov. 2, 1979, Ser. No. 90,724

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—156.4 R **4 Claims**



1. A method of establishing a reduced pressure across an interface between a steam chest and a turbine casing, wherein the steam chest and turbine casing define a fluid aperture for conducting high pressure steam from the steam chest, past the interface, and into an interior of the turbine casing, the method comprising the steps of:

forming a chamber at an end of the interface adjacent the fluid aperture;

separating the interface and the chamber from the fluid aperture to prevent direct contact between the high pressure steam and the interface as steam is conducted through the fluid aperture;

defining a fluid flow path for conducting fluid from the interior of the casing to the chamber;

restricting the fluid flow path from the interior of the casing to the chamber; and

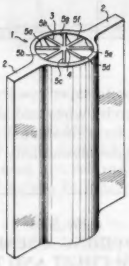
venting the chamber to maintain a reduced pressure lower than the steam chest pressure in the chamber and at the end of the interface adjacent the fluid aperture.

4,296,539

HEAT TRANSFER TUBING FOR NATURAL GAS EVAPORATOR

Takayoshi Asami, Otsu, Japan, assignor to Kobe Steel, Limited, Kobe, Japan

Filed Jan. 29, 1979, Ser. No. 7,324
Claims priority, application Japan, Jan. 27, 1978, 53-8601
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 A **13 Claims**



1. A method of making a heat transfer tube which comprises the steps of:

fabricating an elongate tubular body with two integrally attached planar fin members thereon extending longitudinally to the axis of said tubular body and projecting radially outward from the peripheral surface of said tubular body, and at the same time forming a plurality of longitudinally extending flutes on only the outer surfaces of the tubular body and fin members, while leaving the internal surface of the tubular body smooth and free of surface irregularities;

fabricating a helical fin member including at least three fin elements, each of said fin elements radially projecting from and extending longitudinally to a common axis;

inserting said helical fin member into said tubular body; and

drawing said tubular body alone in the direction of the longitudinal axis of said tubular body such that a pressure-fitting relationship is formed between said helical fin member and the inner surface of said tubular body.

4,296,540

METHOD FOR SEALING A DRYER

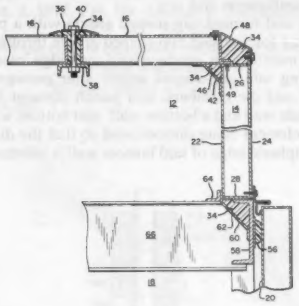
George R. Potter, Coos Bay, Oreg., assignor to Burley Industries, Inc., Coos Bay, Oreg.

Continuation-in-part of Ser. No. 971,845, Dec. 21, 1978, abandoned. This application Sep. 30, 1980, Ser. No. 192,244
Int. Cl.³ B23P *3/00, 19/04*
U.S. Cl. 29—460 **12 Claims**

1. A method for sealing a veneer dryer, having a chamber defined by planar panels connected to each other at respective elongate joints extending along respective mutually adjacent edges of said panels for confining gas at a dryer operating temperature exceeding the ambient temperature outside the chamber, against leakage of said gas from said chamber, said method comprising:

(a) while said panels are connected to each other, fastening respective elongate enclosing members into abutment with mutually adjacent pairs of said panels along said respective joints such that each of said enclosing members bridges and is longitudinally coextensive with a respective one of said joints and thereby forming respective enclosures between said enclosing members and said panels, the interiors of said respective enclosures being exposed to respective ones of said joints;

(b) injecting into said enclosures, at a temperature less than said dryer operating temperature, a heat-resistant, gas-impermeable closed cell curable foam in such quantity that said enclosures are substantially filled with said closed cell foam;



(c) permitting said foam to cure; and

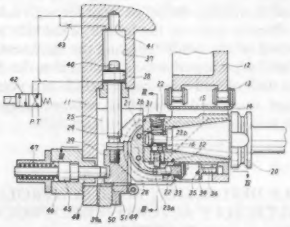
(d) thereafter operating said dryer at said dryer operating temperature and thereby increasing the temperature of said closed cell foam so as to expand said foam within said enclosures into tight sealing abutment with said joints to prevent leakage of said gas from said chamber through said joints.

4,296,541

TOOL STORAGE MAGAZINE FOR A MACHINE TOOL

Akira Tsuboi, and Shiro Kato, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 6, 1979, Ser. No. 100,722
Claims priority, application Japan, Jan. 13, 1979, 54-3320
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **5 Claims**



1. A tool storage magazine for a machine tool comprising:

a plurality of tool sockets mounted to be selectively indexable to an exchange position and pivotable at said exchange position;

a holding plunger slidably received in each of said tool sockets and engageable with a tool stored in an associated one of said tool sockets for holding said tool therein;

first bias means provided in each of said tool sockets for urging said holding plunger toward engagement with said tool stored in an associated one of said tool sockets;

a cradle member pivotably mounted at said exchange position about the same axis as the pivotable movement of any of said tool sockets indexed to said exchange position and having means to carry any of said tool sockets indexed to said exchange position;

a pivot drive mechanism connected to said cradle member

for pivoting the same between first and second angular positions;

a locking member carried on said cradle member and movable onto the sliding path of said holding plunger of any of said tool sockets carried in said cradle member for inhibiting disengagement of said holding plunger from said tool stored in any of said tool sockets;

second bias means provided on said cradle member for urging said locking member onto the sliding path of said holding plunger of any of said tool sockets carried on said cradle member; and

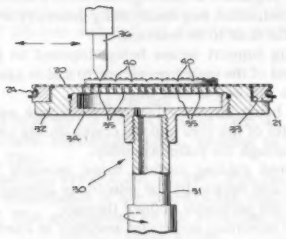
unlocking means engageable with said locking member for retracting the same against said second bias means from the sliding path of said holding plunger of any tool socket carried on said cradle member when said cradle member is pivoted by said pivot drive mechanism to the vicinity of said second angular position.

4,296,542

CONTROL OF SMALL PARTS IN A MANUFACTURING OPERATION

Alexander Gotman, Santa Monica, Calif., assignor to Presco, Inc., Beverly Hills, Calif.

Filed Jul. 11, 1980, Ser. No. 167,667
Int. Cl.³ H01L *21/66*
U.S. Cl. 29—574 **14 Claims**



1. In the process of manufacture of microminiature electronic circuits in which first a flat wafer is formed having a plurality of contact bumps protruding from one flat surface, then the wafer is cut into a number of individual chips each having at least two such contacts, then each chip is individually electrically tested, and thereafter selected chips are incorporated into electrical circuit assemblies;

a method of forming and handling the chips comprising the steps of:

selecting a resilient diaphragm that is larger than the wafer;

stretching the diaphragm and at the same time supporting it in a substantially horizontal position;

placing the wafer upon the upper surface of the prestretched diaphgram with its contacts uppermost;

adhesively securing the entire under surface of the wafer to the upper surface of the diaphragm;

cutting the wafer along two sets of parallel lines so as to form a predetermined array of individual chips supported on the diaphragm;

selectively raising and thereby further stretching a selected portion of the diaphragm so as to elevate a selected one of the chips above the array;

while the selected chip is thus elevated, engaging the protruding contacts thereof for purpose of testing its electrical characteristics;

returning the selected portion of the diaphragm to its original position so that the selected chip resumes its position in the array;

raising other portions of the diaphragm so as to elevate and test other chips;

thereafter again raising the selected portion of the diaphragm so as to again elevate the selected chip; and

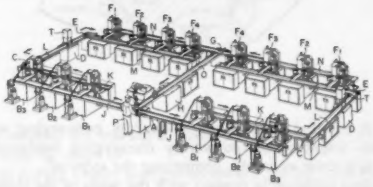
then incorporating the selected chip into an electrical assembly.

4,296,543

METHOD OF AND APPARATUS FOR FABRICATING STATOR ASSEMBLIES OF ELECTRICAL MACHINES

Tokuhito Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1979, Ser. No. 43,027
Claims priority, application Japan, May 30, 1978, 53-65209
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—596 **10 Claims**



1. A method of fabricating stator assemblies for electrical machines on an automated assembly line, each of said stator assemblies having a stator core, main coils and auxiliary coils, said assembly line including a plurality of transfer tools each having a plurality of blades rotatably arranged thereon for carrying said main and auxiliary coils; a plurality of conveyors arranged in a closed loop for successively moving said plurality of transfer tools in one direction, said closed loop conveying path including a first main path having an inlet end, first branch paths extending from said first main path, a second main path merging said first branch paths, second branch paths extending from said second main path and a third main path merging said second branch paths and having a terminal end connected to the inlet end of said first main path; a plurality of main coil winding devices located along corresponding ones of said first branch paths a plurality of auxiliary coil winding devices located along corresponding ones of said second branch paths; and a drawing-in device positioned along said third main path for drawing said main and auxiliary coils into said stator core, said method comprising the steps of:

distributing selectively each of said transfer tools into a corresponding one of said main coil winding devices, said devices being in a stand-by state;

transferring at least one of said main coils to each of said transfer tools;

moving each of said transfer tools from its main coil winding device to merge said tools onto said second main path;

pushing said main coils into the bottom of each of said transfer tools;

indexing each of said transfer tools while on said second main path by rotating the blades therein;

distributing selectively each of said transfer tools into a corresponding one of said auxiliary coil winding devices, said devices being in a stand-by state;

transferring at least one of said auxiliary coils to each of said transfer tools;

moving each of said transfer tools from its auxiliary coil winding devices to merge said tools onto said third main path; and

drawing in the main auxiliary coils carried by each of said transfer tools into said stator core, each of said stator assemblies being thereby fabricated by a single operation of said drawing-in device.

4,296,544

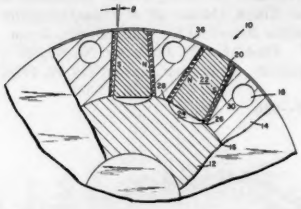
METHOD OF MAKING ROTOR ASSEMBLY WITH MAGNET CUSHIONS

Lyman R. Burgmeier, Cypress; Frederick B. McCarty, San Pedro, and Alexander Silver, Tarzana, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 973,343, Dec. 26, 1978. This application Mar. 11, 1980, Ser. No. 129,546

Int. Cl.[3] H02K *15/02*

U.S. Cl. 29—598 8 Claims



1. A method of inserting outwardly converging wedge-shaped magnets into outwardly converging wedge-shaped slots in a rotor assembly, comprising the steps of:

placing cushions in contact with the walls of the slots;

placing the magnets into the outwardly converging wedge-shaped slots in the rotor assembly; and

rotating the rotor assembly until the magnets become wedged in place in the slots by flowing the material of the cushions therebetween.

4,296,545

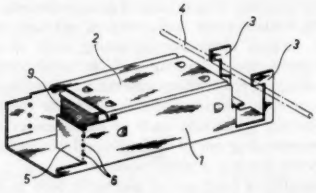
CASING HOOK USED TO IMPREGNATE CHOKE OR TRANSFORMER

Esko Lampinen, Helsinki, and Kari Kajavo, Espoo, both of Finland, assignors to Oy Helvar, Helsinki, Finland

Filed Mar. 31, 1980, Ser. No. 135,890

Int. Cl.[3] H01F *41/00*

U.S. Cl. 29—602 R 6 Claims



1. A method of conveying chokes or transformers through an impregnation vessel containing an impregnating agent comprising:

forming a plurality of hooks which are of one-piece construction with a casing substantially enclosing said choke or transformer;

engaging said hooks with a suspension means;

suspending said casing and enclosed choke or transformer from said hooks;

immersing said suspended casing and enclosed choke or transformer, exclusive of said hooks and said suspension means, in said impregnating agent for periods sufficient to allow impregnation;

and removing said casing and enclosed choke or transformer from said impregnating agent while said hooks remain engaged by said suspension means;

whereby said casing and enclosed choke or transformer are impregnated with said agent and air dried without immersing said hooks or said suspension means.

4,296,546

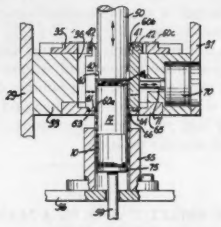
APPARATUS FOR ASSEMBLING ELECTROCHEMICAL CELL

Michael S. Hill, and David A. Poff, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Feb. 15, 1979, Ser. No. 12,659

Int. Cl.[3] B23P *19/04*

U.S. Cl. 29—730 14 Claims



1. Apparatus for inserting an electrode assembly core into a casing for an electrochemical cell, comprising:

support means for the casing, the casing having an open end for receiving the core;

a collet assembly comprised of a plurality of closely spaced tubular segments which together form a smooth, substantially continuous ring conforming generally to the perimeter of the core to be inserted,

said casing support means being disposed to position the open end of the casing proximate to and in axial alignment with an exit end of said ring,

said ring being inwardly tapered to engage and guide the perimeter of the core into the casing during passage of the core through the collet assembly,

said tapered guiding surface being movable radially inwardly and outwardly for selectively altering the dimension of the perimeter defined thereby;

means for mounting said collet assembly in fixed relation to said casing support means;

controllable mechanical stop means for restricting the radially outward movement of the guiding surface to a first radial dimension, during one portion of the travel of the core through the collet assembly, and to a second radial dimension during another portion of the travel of the core through the collet assembly,

core stuffer means for axially pushing the core through the collet assembly and into the casing; and

means responsive to the axial location of the core for controlling the mechanical stop means.

4,296,547

APPARATUS FOR LOADING A PULL TAB ON A SLIDER BODY

Tsutomu Hakoi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

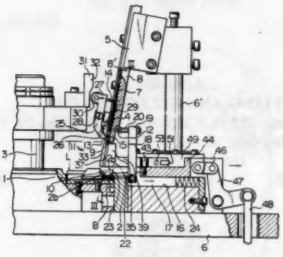
Filed Dec. 21, 1979, Ser. No. 106,041

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—766 3 Claims

1. An apparatus for loading a pull tab on a slider body in a machine for progressively assembling sliders for slide fasteners, said machine comprising a base, a turret supported on the base for intermittent rotation about its center axis and having a plurality of spaced-apart recesses arranged circumferentially around and on said turret for receiving and holding a slider body, a plurality of assembling stations arranged around the periphery of said turret, and means for intermittently rotating said turret so as to position a slider body holding recess successively opposite each of the stations, said apparatus being at one assembling station of said assembling stations and comprising a pull tab supply means and a pull tab holding means; said pull tab supply means includes a holder provided on the base, a

chute supported by said holder and extending substantially vertically for receiving longitudinally aligned pull tabs therein and directing them toward a pull tab receiving portion in said recess by gravity, and means for discharging pull tabs one by one from the chute; said pull tab holding means is positioned between an outlet of said chute and the pull tab receiving portion of said recess and is movable between an advanced



position and a retracted position; said pull tab holding means being arranged to form a guide channel for receiving a pull tab discharged from the chute between said outlet of said chute and the pull tab receiving portion of said recess in said advanced position, and means for opening the guide channel in said retracted position to thereby release a pull tab therefrom to drop said tab into said pull tab receiving portion of said turret recess.

4,296,548

METHOD FOR SPLICING AN ELECTRICAL CABLE

James N. Zehren, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 816,493, Jul. 18, 1977, Pat. No. 4,198,173, which is a continuation of Ser. No. 616,318, Sep. 24, 1975, abandoned. This application Oct. 15, 1979, Ser. No. 84,756

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—871 **3 Claims**

1. A method of splicing first and second sections of electrical cable, comprising the steps of:

providing transversely constrictive sleeve means;

sliding said sleeve means onto said first cable section;

forming an electrical splice between conductors in said first and second cable sections;

positioning said sleeve means over said electrical splice so that the sleeve means receives opposed end portions of said first and second cable sections;

attaching one end of said sleeve means to said first cable section;

pushing said cable sections toward each other to provide slack in said opposed end portions of the cable sections; and

attaching the other end of said sleeve means to said second cable section, wherein each of said attaching steps comprises:

providing a grommet having mating parts adapted to be forced together around a cable section;

forcing the mating parts of the grommet together around the respective cable section to grip the section therebetween;

slipping the respective end of the sleeve means over the grommet;

providing encircling fastening means around the sleeve means; and

tightening the fastening means around the sleeve means over the grommet.

4,296,549

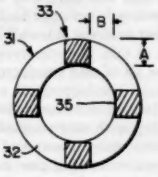
METHOD OF MAKING A LEAD SOCKET INSERT

Guido Bertoglio, Viganello, Switzerland, assignor to Augat Inc., Attleboro, Mass.

Division of Ser. No. 926,227, Jul. 19, 1978, Pat. No. 4,186,990. This application Aug. 3, 1979, Ser. No. 63,382

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—874 **4 Claims**



1. A method for making a lead socket insert, said method comprising the steps of:

center boring a wire segment to form a hollow cylinder;

removing material for a portion of the length of said cylinder parallel to its longitudinal axis and tangential to the inner peripheral surface thereof thereby forming at least two oppositely disposed fingers having confronting spaced parallel flat surfaces; and then

bending said fingers inwardly toward the longitudinal axis of said cylinder to provide a converging configuration;

whereby said fingers flex in the manner of a leaf spring fixed at its proximate end connected with said cylinder.

4,296,550

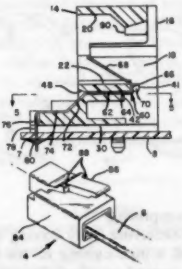
METHOD OF MANUFACTURING ELECTRICAL CONNECTOR RECEPTACLE

Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 944,095, Sep. 20, 1978, Pat. No. 4,186,988. This application Nov. 8, 1979, Ser. No. 92,618

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—884 **1 Claim**



1. A method of manufacturing an electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said plug-receiving opening having opposed internal sidewalls and opposed internal endwalls, said housing having oppositely directed external sidewalls and oppositely directed external endwalls, a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising a contact spring

extending from one of said internal sidewalls at a location adjacent to said plug-receiving end diagonally into said plug-receiving opening and towards the opposite internal sidewall, and each conductor having a lead portion extending from said plug-receiving end through said housing between said one internal sidewall and the adjacent external sidewall and towards said rearward end, said plug-receiving opening being dimensioned to receive a connector plug having spaced-apart contact members therein which engage contact spring portions of said conductors, said method comprising the steps of:

manufacturing said housing as a one-piece molding having a single conductor-receiving opening extending therethrough from said rearward end to said plug-receiving end, which opening is between said one internal sidewall and the adjacent external sidewall and which has a constricted width at said plug-receiving end which is sufficient to receive all of said conductors,

manufacturing said conductors as a continuous strip of stamped and formed conductors in side-by-side spaced-apart relationship with said conductors extending from a continuous carrier strip means and with the spacing between at least portions of adjacent conductors in said strip the same as the required spacing between adjacent conductors in said connector receptacle,

severing a section of said strip having a number of conductors thereon equal to the number of conductors required in said connector receptacle,

inserting said conductors in said section through said conductor-receiving opening and positioning intermediate portions of said conductors in said conductor-receiving opening,

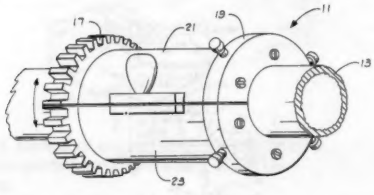
severing said carrier strip means from said section of strip, and reversely bending first end portions of said conductors which extend beyond said plug-receiving end and positioning said first end portions in said plug-receiving opening whereby said first end portions constitute said contact springs and said intermediate portions constitute said lead portions with second end portions of said conductors extending beyond said rearward face and being adapted for connection to further conductors.

4,296,551

RACHETING PIPE CUTTER

Leroy Boyd, 1900 Fox Ave., Moore, Okla. 73160

Filed Dec. 10, 1979, Ser. No. 102,821
Int. Cl.³ B23D *21/06*; B26B *27/00*
U.S. Cl. 30—98 **10 Claims**



1. A pipe cutter comprising:

a cylindrical pipe-receiving body having a turning gear at one end thereof, a pipe cutting means at the other end thereof and a central portion disposed longitudinally therebetween connecting said pipe cutting means and said turning gear, said pipe-receiving body comprising two longitudinal portions joined by a hinge to allow said pipe-receiving body to be opened and closed about a pipe, said hinge being disposed longitudinally on said central portion between said turning gear and said pipe cutting means such that said hinge does not contact and does not extend into said turning gear and said pipe cutting means; and

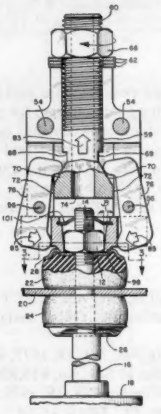
lever means for rotating said pipe-receiving body about a pipe, said lever means having a lever arm for manual operation of the pipe cutter and a pawl for engaging said turning gear in a ratchet motion, and said lever means having a race for receiving said turning gear.

4,296,552

CUTTING AND SPLITTING TOOL

David B. Sabatino, 253 N. California, Mundelein, Ill. 60060

Filed Oct. 25, 1979, Ser. No. 87,985
Int. Cl.³ B26B *17/00*
U.S. Cl. 30—183 **19 Claims**



1. An improved cutting tool comprising:

a housing means having a first channel extending along an axis therethrough and at least one second channel substantially perpendicularly intersecting said first channel, said housing means being formed to have an opening at the intersection of said channels;

a shaft means slidably disposed for linear movement in said first channel, said shaft means including a first portion configured to have a tapered camming surface and a second portion;

cutting means slidably disposed for linear movement in said at least one second channel, said cutting means including a cutting edge movable into said opening from one side, said cutting edge being constructed and disposed so that it is substantially parallel to said axis during linear movement of said cutting means;

means coupled to said housing means for forming a surface on a side of said opening opposite to said one side;

cam follower means pivotally mounted in said housing means and having a first surface for engaging said camming surface and a second surface for engaging said cutting means; and

means coupled to said second portion of said shaft means for causing linear movement of said shaft means and corresponding movement of said camming surface;

said camming surface being coupled to rotate said cam follower means upon movement of the shaft means in one direction to cause linear movement of said cutting means in said at least one second channel and corresponding linear movement of said cutting edge in said opening and towards said surface means.

4,296,553

PORTABLE POWER CHAIN SAW

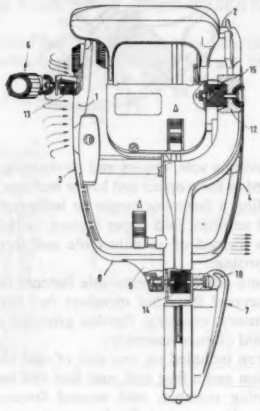
Rudolf Dirks, Weinstadt-Schnait, and Karl Nitschmann, Schorndorf, both of Fed. Rep. of Germany, assignors to Adreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 95,053

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911498

Int. Cl.³ B27B *17/00*

U.S. Cl. 30—381 **21 Claims**



1. A portable power chain saw, comprising in combination:

a housing;

at least one grip including an end for connection and operatively connected to said housing;

vibration attenuating means for each grip connection having a longitudinal central axis as well as being arranged between the end of a grip and said housing;

a support part operatively connected to said housing and the end of said grip belonging therewith for each grip connection as well as being exchanged and installed subsequently for the motor chain saw without great cost and complexity, said support part extending between said housing and a grip belonging therewith, said support part extending generally parallel to the longitudinal central axis of said vibration attenuating means;

at least one of said support part and said housing including an opening, and a securing member inserted in said opening with play and serving to limit movement of said support simultaneously as overload protection for said vibration attenuating means.

4,296,554

TAPE MEASURE AND MARKING DEVICE

Everett A. Hammerstrom, 34016 Edmonton, Farmington Hills, Mich. 48024

Filed Aug. 18, 1980, Ser. No. 179,026

Int. Cl.³ G01B *3/10*; B43L *9/04*

U.S. Cl. 33—138 **4 Claims**

1. A marking device for a measuring tape of the type carried in a housing with the tape coiled inside, comprising:

a spring clip attached at one end to the side of the housing,

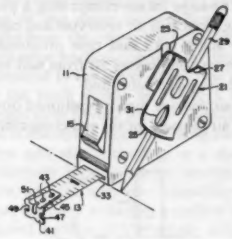
said spring clip having a 180-degree bend adapted to engage the belt, a pocket, or edge of clothing,

a marking member,

said spring clip having an opening adapted to receive said marking member in the bend portion thereof,

said clip further having an ovoid aperture in the end removed from the end attached to said housing, and being adapted to engage said marking member when inserted through said opening,

said spring clip further being curved at said ovoid aperture away from the end attached to said housing,



said spring clip being fixed to said housing at an angle to position said marking member engaged within said opening and said ovoid aperture in alignment with the point on said housing where said tape exits from said housing.

4,296,555

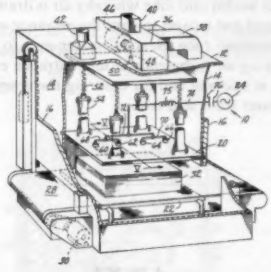
METHODS AND APPARATUS FOR CONDITIONING PLYWOOD VENEER WITH HIGH FREQUENCY RADIO ENERGY

Mark D. Preston, Meeting House Hill Rd., Mason, N.H. 03048

Filed Jan. 21, 1980, Ser. No. 113,659

Int. Cl.³ F26B *3/34*

U.S. Cl. 34—1 **15 Claims**



1. A method of conditioning a multiplicity of sheets of veneer in a batch comprising the steps of arranging the sheets in a stack, placing the stack between a pair of electrodes, applying a predetermined pressure to the stack between the electrodes, applying radio frequency energy to the electrodes, sensing changes in moisture content of the stack under the influence of the radio frequency energy, partially relieving the pressure in response reaching a predetermined level of moisture content and continuing the application of radio frequency energy to the electrodes.

4,296,556

ROD COOLING BOX AIR WIPE NOZZLE

Lynn W. Bray, Antioch, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 10, 1980, Ser. No. 139,074

Int. Cl.³ F26B *13/28*

U.S. Cl. 34—107 **2 Claims**

1. An air wipe nozzle apparatus for removing water from a rod in a rod mill, said apparatus including:

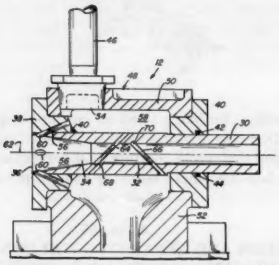
(a) compressed air housing means, including means defining an air inlet connected to a source of compressed air and an air reservoir for receiving compressed air from said air inlet;

(b) air nozzle means extending through said compressed air

housing and being configured as a tube having an entrance end and an exit end permitting the passage of rods axially therethrough, said air nozzle means including:

(i) first air passage means comprising a plurality of holes extending from said air reservoir and communicating at an acute angle with said tube proximate the entrance end to direct compressed air from said reservoir against a rod entering said tube, and

(ii) second air passage means positioned downstream from said first air passage means and comprising a pair of slits



extending through a portion of said tube from said air reservoir oriented at about forty-five degrees with respect to the axis of said tube and the direction of rod movement therethrough and being oriented substantially normal to each other for producing a venturi effect within said tube whereby air is drawn in from the exit end and moved toward the entrance end for wiping a contained tube clean of water and to create water stripping air turbulence at said entrance end and a vacuum at said exit end for ensuring the complete removal of water from said rod.

4,296,557

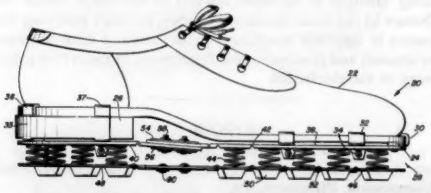
SHOE WITH SOLE CUSHIONING ASSEMBLY

Paul D. Pajevic, 475 N. Northwest Hwy., Park Ridge, Ill. 60068

Filed Jan. 31, 1980, Ser. No. 118,076

Int. Cl.[3] A43B *3/10*; A43C *15/00*

U.S. Cl. 36—7.8 **14 Claims**



1. A shoe with a sole cushioning assembly comprising a sole, a substantially flat flexible sole segment juxtaposed with said shoe sole and including a plurality of hinges spaced along the length of said sole segment to provide flexibility to said sole segment, a plurality of cushioning means attached to said sole segment and a plurality of cushion pads associated with said cushioning means, said cushion pads being the surface contacting portion of said shoe and being flexibly mounted substantially along the entire length of said sole.

4,296,558

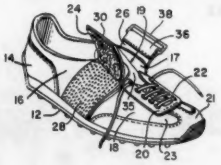
ADJUSTABLE AND FLEXIBLE CLOSURE ASSEMBLY FOR SHOES WITH SEGMENTED UPPERS

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Feb. 12, 1979, Ser. No. 11,511

Int. Cl.[3] A43B *11/00*

U.S. Cl. 36—50 **11 Claims**



1. A shoe having a sole, uppers and an opening, said uppers being segmented to form upper and lower sections, each of said sections including a fastening means to independently adjust and fasten said sections, said upper section including a single fastener means formed of an adjustable and flexible closure assembly comprising:

a flexible, multi-adjustable, separable fastener means having first and second fastening members including arrays of complementary, coacting, flexible gripping elements for securing said closure assembly;

a fastener strap included on one side of said shoe having a fixed portion and a free end, said free end including said first fastening member, said second fastening member positioned adjacent said fixed portion of said fastener strap; and

an anchor strap having a fixed portion and a free end, said free end having an opening, said fastener and anchor straps overlaying said upper section and having fixed portions being attached adjacent said sole of said shoe and located to support the arch of the wearer's foot whereby said free end of said fastener strap passes through said opening in said anchor strap permitting the shoe to be adjusted to the precise desired tautness across said upper section of said shoe.

4,296,559

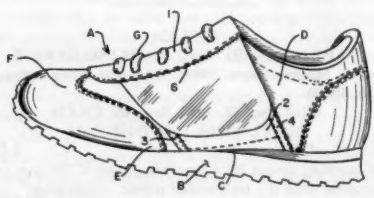
ATHLETIC SHOE POCKET

Robert J. Gamm, Olivette, Mo., assignor to Envoys U.S.A., Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 938,098, Aug. 30, 1978. This application Dec. 26, 1979, Ser. No. 107,092

Int. Cl.[3] A43B *23/00*

U.S. Cl. 36—136 **14 Claims**



1. In a pocket for an athletic shoe and designed to hold smaller size personal items such as keys, coins, or the like as during jogging, comprising, said shoe having a quarter portion fixed to the sole shank at its lower extent, a pocket being stitched to the shoe quarter approximately along its front, back, and lower edges, the upper edge of the pocket being substantially free of connection with the shoe quarter and forming a pocket slot that is capable of being pulled open for

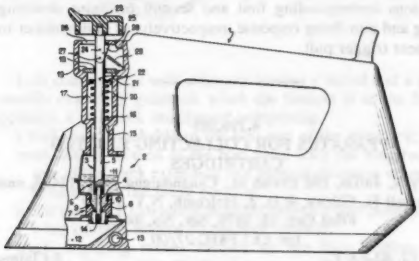
insertion of the aforementioned items therein, a cover flap stitched to the shoe along its upper edge approximately along the shoe eyestay and capable of folding over into contiguity upon the said pocket and provide it and its opening slot with coverage, and fastening means provided upon both the cover flap and the exterior of the pocket and cooperating to hold the said flap against the said pocket during shoe usage.

4,296,560

WATER INJECTION DEVICE FOR A STEAM IRON

Pierre Schwob, Lyons, France, assignor to SEB S.A., Selongey, France

Filed Jan. 30, 1980, Ser. No. 116,810
Claims priority, application France, Feb. 13, 1979, 79 03622
Int. Cl.[3] D06F *75/06, 75/18*
U.S. Cl. 38—77.81 **8 Claims**



1. A water injection device for a steam iron, comprising a plunger adapted to be moved axially over a predetermined range of travel within the orifice of a nozzle formed of elastic material and adapted to encircle said plunger in closely fitting relation thereto, the nozzle orifice being substantially coaxial with the plunger and intended to provide a communication between a water reservoir and a vaporization chamber, a longitudinal groove being formed along part of the length of the plunger, the range of travel of said plunger being such that the two ends of said groove are located on each side of the orifice in a first end position and that the two ends of said groove are located on one side of said orifice in a second end position in which second end position said plunger closes said orifice, wherein the nozzle comprises an annular portion of elastic material, a thin lip being formed on the internal wall of said annular portion in order to delimit the orifice of said nozzle, said nozzle and plunger being in contact with each other in both of said positions.

4,296,561

PICTURE FRAME HAVING INTEGRAL LATCHING MEANS

Peter Lawrence, 33 E. 22nd St., New York, N.Y. 10010

Continuation-in-part of Ser. No. 34,545, Apr. 30, 1979. This application Mar. 5, 1980, Ser. No. 127,328
Int. Cl.[3] A47G *1/06*; G09F *1/10*
U.S. Cl. 40—158 R **22 Claims**

1. A frame for pictures, prints, or the like, comprising:

a relatively rigid, flat base, having marginal edges; the base having a front surface and an opposite rear surface;

a flat cover formed of flexible material having a degree of resiliency; the cover having a front and a rear surface; the rear surface of the cover being placed over the front surface of the base; the cover having a first edge portion and a second edge portion opposite the first edge portion;

latch means secured to the cover at the first edge portion of the cover; the latch means including a relatively rigid relatively rigid strip having greater rigidity than the flexible material of the cover, the strip being located at the first edge portion and also extending in a distance partway from the relatively rigid first edge portion to the second edge portion, and the strip also extending along the first edge portion; the strip including a surface thereof secured to the adjacent surface of the cover, whereby the strip secured to the flexible cover prevents the cover from flexing where the cover surface and strip surface are secured together;

a rigid flap on the rigid strip for extending down the rear surface of the base; the flap having greater rigidity than the flexible material of the cover; the latch means flap being long enough that the relatively rigid flap holds the cover securely on the base;

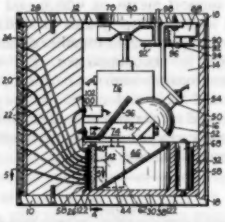
the cover being secured to the base at a location away from the first edge portion of the cover, thereby enabling the first edge portion to be latched to the base and to be moved away from the base.

4,296,562

TRAVELING LIGHT DISPLAY

George A. Sanborn, 19210 NE. Clackamas St., Portland, Oreg. 97230

Continuation of Ser. No. 887,753, Mar. 7, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,848
Int. Cl.[3] G09F *19/00*
U.S. Cl. 40—438 **4 Claims**



1. A traveling light display, comprising:

(a) an elongated reader member having therethrough a multiplicity of light passageways arranged in laterally and longitudinally spaced-apart relationship,

(b) a source of light spaced from the reader member and arranged for directing light through said passageways, the source of light including an electric lamp in an electric circuit of a source of electric potential,

(c) an elongated opaque tape having therethrough a multiplicity of holes spaced apart laterally and longitudinally for registration with passageways in the reader member and arranged in patterns forming a plurality of longitudinally spaced indicia,

(d) drive means engaging the tape for moving the latter longitudinally past the reader member for producing at the light passageways said indicia patterns as spots of light moving across the reader member from one end to the other, the tape drive means including an electric drive motor in an electric circuit of a source of electric potential, an air fan driven by the tape drive motor, and an electric switch arranged in the electric circuits of the electric lamp and drive motor and operable by a predeter-

mined velocity of air driven from the fan to complete said electric circuits and operable in the absence of said predetermined velocity of air to open said electric circuits,

(e) an elongated viewing member, and

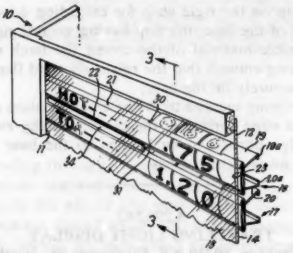
(f) coupler means registering with each passageway in the reader member for causing a spot of light appearing at a passageway to result in the display of a spot of light at the viewing member moving across the latter from one end to the other.

4,296,563

DISPLAY DEVICE WITH PRICE CHANGE CARTRIDGES

Joseph Clement, Bradenton, Fla., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 5, 1980, Ser. No. 175,476
Int. Cl.³ G09F 11/18
U.S. Cl. 40—518 **7 Claims**



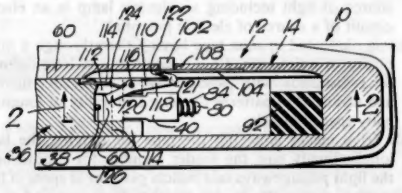
1. In a display device of the type comprising a translucent facia, a carrier disposed behind said facia and including a display area, at least one information strip bearing a series of characters and being mounted on said carrier for slidable adjustment so that the characters can be sequentially displayed in said display area, support means on which said carrier is detachably mounted with the display area located adjacent said facia, said facia and support means together defining a space in which said carrier is accommodated, the improvement wherein said support means comprises panels located adjacent opposite ends of said facia and complementary attachment means provided on said carrier and on said support means, said complementary means comprising rails provided on said panels and flanges provided on said carrier.

4,296,564

SEMI-AUTOMATIC RELOADING FIREARM

E. Ernest Oberst, Cheshire, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.

Filed Jun. 18, 1979, Ser. No. 49,347
Int. Cl.³ F41C 27/12
U.S. Cl. 42—1 C **2 Claims**



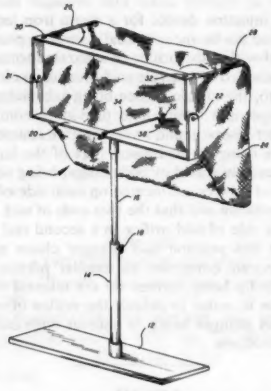
1. In a firearm having a receiver member, a firing chamber, a breech bolt member spring-urged into closed position and retracted therefrom into open position by the powder gases of a fired cartridge, a cartridge magazine, a device for feeding a cartridge from the magazine into the firing chamber on each cycle of the breech bolt member into open and closed position, a hidden hammer in said receiver member moved into cocked position by the breech bolt member on its retraction from closed position and spring-advanced into firing position on release in its cocked position, and means including a trigger for releasing said hammer in its cocked position on pulling the trigger, the combination of a visible signal element movable on the receiver member, and an actuator pivoted on said breech bolt member for turning movement thereon, with said actuator being spring-urged into a first position in the path of said hammer to be cammed thereby into a second position on the advance of said hammer into firing position, and said signal element is in and out of follower relation with said actuator in said closed and open positions, respectively, of said breech bolt member, with said signal element when in follower relation with said actuator assuming in said first and second actuator positions corresponding first and second positions denoting firing and non-firing response, respectively, of said hammer to the next trigger pull.

4,296,565

APPARATUS FOR COLLECTING EJECTED CARTRIDGES

Harry A. Jaffin, 190 Parish St., Canandaigua, N.Y. 14424, and Russell H. Gliewe, R.D. 3, Holcomb, N.Y. 14469

Filed Oct. 15, 1979, Ser. No. 84,555
Int. Cl.³ F41C 27/00
U.S. Cl. 42—1 T **8 Claims**



1. A free-standing structure for receiving cartridges automatically ejected from a firearm upon firing from a predetermined location, said structure comprising:

(a) wall means of flexible, resilient, unstretched material forming a bag-like enclosure with an unobstructed opening at one end;

(b) a rigid frame attached to said wall means and holding said one end of said wall means in a position laterally adjacent said predetermined location and physically separated from said firearm, with said opening fully occupying a plane intersected by cartridges ejected by said firearm when fired from said predetermined location, whereby said ejected cartridges pass through said opening and strike the interior of said bag-like enclosure; and

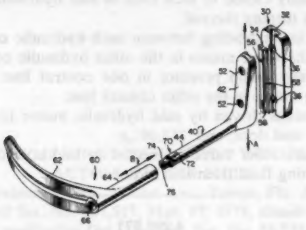
(c) support means holding said wall means outwardly from said frame to provide a portion of said wall means directly opposite and spaced from said opening in a slack, unstretched condition to substantially prevent rebound of said cartridges.

4,296,566

ARM OR SHOULDER ATTACHMENT FOR GUNSTOCKS

Conrad Campos, P.O. Box 687, Tonopah, Nev. 89049

Filed Aug. 28, 1979, Ser. No. 70,420
Int. Cl.[3] F41C *23/00*
U.S. Cl. 42—71 R 2 Claims



1. In combination with a firearm having a barrel and a rearwardly extending gunstock when the firearm is in the firing position, a gunstock attachment comprising:

a butt plate attachable to the butt end of the gunstock;

track means formed in the butt plate with the longitudinal axis of the track extending in a vertical direction when the firearm is in the firing position;

a first gunstock extending member having a foot portion and a leg portion normal to the foot portion;

track engaging means formed on the foot portion and adapted to engage the track means on the butt plate;

means for releasable securing the track means and track engaging means to each other;

a second gunstock extending member comprising a body engaging arm member and a rod member, said rod member telescopically engaging the leg member of the first gunstock extending member;

means for securing said rod member to the leg member,

wherein the second gunstock member is rotatable relative to the first gunstock extending member;

wherein the means for securing said rod member to the leg member prevents relative telescopic movement and relative rotational movement between the members; and

wherein the securing means for said rod member and the leg member comprise a bolt and split sleeve carried by the extended rearward end of the leg member.

4,296,567

FIGURE TOY WITH FLEXIBLE APPENDAGES

Pascal M. Kamar, Palos Verdes Estates, Calif., assignor to Kamar International, Inc., Torrance, Calif.

Filed Apr. 22, 1980, Ser. No. 142,786
Int. Cl.[3] A63H *3/46*
U.S. Cl. 46—163 6 Claims

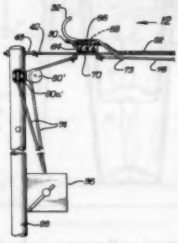
1. A figure toy adapted for undergoing simulated contortions, comprising a body part, the body part having a plurality of appendages, such appendage including a flexible manipulatable portion and an end section, the said portion being between the body part and the end section, the said end section having a construction which is weighted whereby to have a holding capability whereby the toy can be supported or suspended from a surface by way of at least one of the appendages and its end section having engagement with the surface, said end section having sufficient weight to hold the toy suspended.

4,296,568

AGRICULTURAL CROP COVER

Jesse M. Dukes, P.O. Box 1184, Hemet, Calif. 92343

Filed Nov. 5, 1979, Ser. No. 91,472
Int. Cl.[3] A01G *13/00*
U.S. Cl. 47—20 10 Claims



1. An apparatus for protecting crops against frost damage, said apparatus of the type having a framework supported by a plurality of erect posts planted permanently in the earth and a movable cover supported by and above said framework and above the crops, said cover being capable of being extended over the top of the framework to protect the crops from damage resulting from still air radiation frost, the improvement comprising:

a static rigging attached to said posts;

means for connecting said cover to said static rigging at a location along a center row of said posts; and

means for transporting at least one outer edge of said cover between a first outer edge of said framework and any position between said center row location and said outer edge, said transporting means being supported by said static rigging; and being moved by running rigging, and

means for scooping portions of said cover from said static rigging and gathering said cover on said transporting means as said transporting means moves from said first outer edge to said other positions.

4,296,569

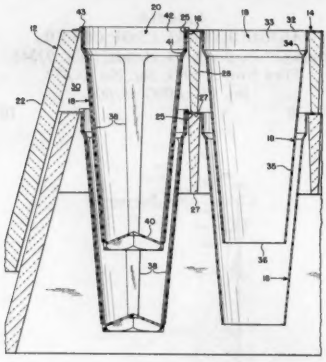
NESTABLE AND STACKABLE TRANSPLANTING SYSTEM

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 22, 1979, Ser. No. 87,286
Int. Cl.[3] A01G *23/02*
U.S. Cl. 47—73 9 Claims

1. An assembly adapted for growing a plurality of plants intended to be transplanted, said assembly comprising a support tray, a plurality of integrally interconnected sleeves, said tray having sidewalls and a grid-like upper structure, said sidewalls being inclined upwardly and inwardly from an open bottom of said support tray to said grid-like upper structure, said upper structure comprising a plurality of vertical wall means spaced apart longitudinally and laterally of said tray, said vertical wall means defining a first predetermined vertical dimension from the uppermost surface of the grid-like structure to the lowermost surface of the vertical wall means, the sidewalls defining a second predetermined vertical dimension

from the uppermost surface of the grid-like structure to the lowermost edge surface of the tray, the second predetermined vertical dimension being greater than the first predetermined vertical dimension, said plurality of integrally interconnected sleeves including a plastic sheet forming web means interconnecting the upper extremities of the sleeves, the sleeves depending downwardly from the web means and arranged in a pattern permitting the web means to be disposed on the uppermost surface of the grid-like structure with the sleeves depending between the vertical wall means, each of the sleeves having walls tapering downwardly and inwardly from the uppermost extremity to the lowermost extremity thereof, the vertical dimension of the sleeve being substantially greater than said first predetermined vertical dimension and less than said second predetermined vertical dimension, whereby a plurality of said assemblies are stackable and nestable with each sleeve nesting in a sleeve below, the upper sleeve being spaced from the below sleeve so that said assemblies are freely denested from each other.

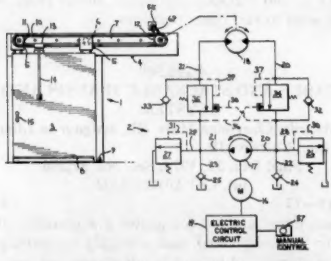


4,296,570

HYDRAULIC DOOR OPERATOR

George C. Balbach, Lake Forest, Ill., and Robert J. Peterman, Cedarburg, Wis., assignors to Arthur Smith Industries, Inc., Milwaukee, Wis.

Filed Sep. 7, 1979, Ser. No. 73,275
Int. Cl.[3] E05F *15/02*
U.S. Cl. 49—360 **14 Claims**



1. A door operator having a hydraulic system for opening and closing a door, comprising:

a hydraulic pump for pumping fluid,

an electric motor for rotating said pump;

an electric control circuit which activates said electric motor to rotate said pump in the appropriate direction;

a reversible hydraulic motor connected through hydraulic control lines with said pump to be driven thereby, said hydraulic control lines comprising a first line between a first side of said hydraulic pump and a corresponding side of said hydraulic motor and a second line between a second side of said hydraulic pump and a corresponding side of said hydraulic motor;

valve means in each of said hydraulic control lines between said hydraulic pump and said hydraulic motor that are normally closed to lock fluid in said hydraulic motor to block turning thereof;

a pilot line extending between each hydraulic control line and the valve means in the other hydraulic control line, whereby pump pressure in one control line opens the valve means in the other control line;

drive means driven by said hydraulic motor to open and close said door; and

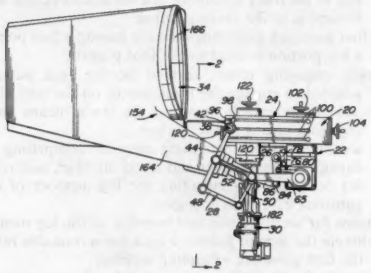
a pressure relief valve connected to said control lines for diverting fluid from said motor.

4,296,571

PROFILE GRINDING APPARATUS

Joseph Horvath, 11 Notch Rd., Clifton, N.J. 07013

Filed Aug. 16, 1979, Ser. No. 66,945
Int. Cl.[3] B24B *17/02, 49/12, 17/04*
U.S. Cl. 51—32 **14 Claims**



1. A profile grinding apparatus comprising a stationary frame, a first table adapted for holding a template thereon and mounted on said frame, a second table mounted on said frame, said second table being arranged to hold a workpiece at a fixed position, pantograph means movable in a horizontal plane and comprising guiding means for movement in said plane, first movable support means mounted on said stationary frame and coupled to said pantograph means for following the movement of said guiding means, second movable support means mounted on said stationary frame at a spaced location below said first movable support means and connected to said first movable support means for corresponding movement therewith, grinding means carried by said first and second movable support means and arranged for reciprocation along a vertical axis between said first and second support means to grind a countour on a workpiece held on said second table, both said first and second movable support means being mounted on said stationary frame by a movable support assembly, said movable support assembly comprising first rod means having a longitudinal axis about which said first rod means is rotatable, said first rod means being mounted on said stationary frame with said longitudinal axis vertical, first bracket means fixedly secured to said first rod means, second bracket means fixedly secured to said first rod means below said first bracket means, second rod means having a logitudinal axis about which said second rod means is rotatable, said second rod means being supported with its axis vertical and for rotation thereabout by first and second bracket means, third bracket means fixedly secured to said second rod means, fourth bracket means fixedly secured to said second rod means below said third bracket means, said third bracket means being pivotable connected to

said pantograph means and to said first movable support means at a vertical pivot axis, said fourth bracket being pivotably connected to said second movable support means at said vertical pivot axis, said grinding means including a grinding surface located tangent to said vertical pivot axis.

4,296,572

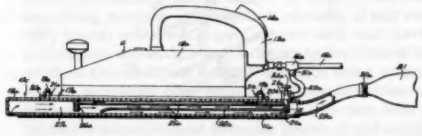
DUST REMOVING ATTACHMENT DEVICE FOR AUTOMATIC AIR FILES

Pedro Quintana, 1920 E. Wilder Ave., Tampa, Fla. 33610

Division of Ser. No. 887,517, Mar. 17, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,330

Int. Cl.³ B24B *55/06*

U.S. Cl. 51—170 TL **5 Claims**



1. A dust removing attachment device for pneumatically driven straight-line power files of the type having a reciprocative sole plate comprising, in combination, an elongated, rectangular replacement shoe member, means for removably attaching a flat upper surface portion of said replacement shoe member to said sole plate, said shoe member being substantially hollow to define an end-to-end internal chamber, the underside of said shoe member being formed with a plurality of peripherally-spaced through openings, means energized by pressurized air for creating a vacuum in said chamber operative to withdraw air peripherally from the underside of said shoe member into said vacuum chamber together with abraded particles generated upon use of the automatic air file, a dust bag communicating with one end of said replacement shoe member, said vacuum creating means comprising an air jet directed into the interior of said dust bag through said one end of said dust bag for inflating it with dust-carrying air from said vacuum chamber, said air jet being disposed adjacent said one end of said replacement shoe member, and a second air jet within said vacuum chamber and longitudinally spaced from said first mentioned air jet.

4,296,573

AUDIENCE CONTROL BARRIER

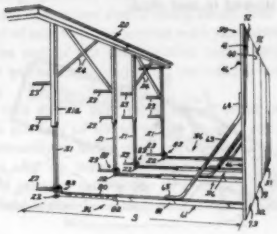
Kermit H. Wilson, Edina, and Ronald R. Carlson, Excelsior, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Filed Jul. 18, 1979, Ser. No. 58,669

Int. Cl.³ E04D *3/10*; **E04H** *17/18*

U.S. Cl. 52—6 **13 Claims**

1. In combination, an elevated stage having support legs, and a modular audience control barrier secured to said legs near the bottoms thereof, said barrier comprising a plurality of modules, each including a rigid panel and bracket means for supporting said panel in a vertical orientation and in spaced



relation to said stage, and means interconnecting said modules in edge-to-edge relationship.

4,296,574

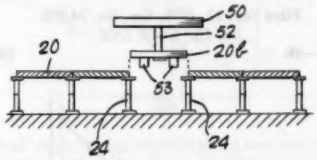
FLOOR PANEL-FURNITURE SUPPORT SYSTEM

William I. Stephens, Telford, Pa., assignor to Knoll International, Inc., New York, N.Y.

Continuation of Ser. No. 877,619, Feb. 14, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 86,751

Int. Cl.³ E04F *15/024*

U.S. Cl. 52—27 **6 Claims**



1. In a floor panel system that includes a plurality of floor panels, and support means positioned upon a fixed base floor supporting said floor panels in fixed position above said base floor, the improvement in which at least one of said floor panels rests upon said support means in freely-removable relationship therewith and includes as an operatively interconnected part thereof means for holding and supporting a furniture item.

4,296,575

AUTOMOBILE SHED

Diara Verable, and Willie M. Gibson, both of 3803 Groton St., San Diego, Calif. 92110

Filed Dec. 26, 1979, Ser. No. 106,911

Int. Cl.³ E04B *7/16*

U.S. Cl. 52—66 **1 Claim**

1. A liftable vehicle storage shed comprising:

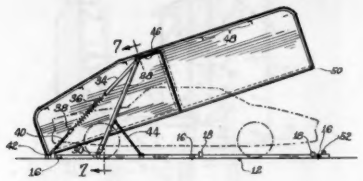
(a) a horseshoe-shaped box-beam frame having two legs and a rear cross member;

(b) a substantially flattened housing conforming generally to the exterior shape of a vehicle and hinged to said frame crossbeam to fall flush against said horseshoe-shaped frame when in lowered position to define an enclosed space over the surface on which it rests, said housing

being pivotal on said crossbeam from said lowered position to a raised position providing access therewithin;

(c) said box-beam being bolted down to a flat driving surface by inwardly directed L-shaped flanges to prevent tampering with mounting bolts in said flanges when said housing is lowered, and said box beam also mounting upwardly directed parallel guide members to guide the periphery of said housing into seated position;

(d) an access door positioned to substantially align with a vehicle stowed in said shed;



(e) means for maintaining said housing in raised position comprising a rigid strut pivoted at the lower end thereof at a first point on said frame and defining a tracking member at its upper end, and further including an adjustable extension spring means connected between an upper portion of said strut and a point on said frame reward of said first point, and said housing defines a longitudinal track slideable engaging said tracking member; and

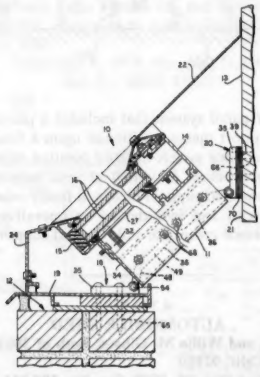
(f) a tether connected between said housing and said frame to limit the extent of opening of said housing.

4,296,576

SLOPED WALL STRUCTURE AND ANCHOR CLIP

Hoyt G. Rice, Jr., Ellenwood, and Daniel J. Reynolds, Austell, both of Ga., assignors to The Anaconda Company, Denver, Colo.

Filed Sep. 12, 1979, Ser. No. 74,875
Int. Cl.³ E04B 7/02
U.S. Cl. 52—90 **10 Claims**



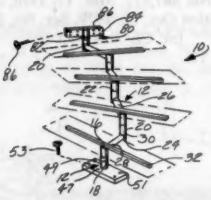
1. A sloped wall structure for extending between a lower horizontal support and an upper vertical support, a plurality of rectilinear rafters positioned in spaced relationship with respect to one another and inclined upwardly from the lower horizontal support to the upper vertical support, infill sheets mounted on said rafters and forming with said rafters a sloped wall, each of said rafters including in cross section a pair of spaced vertically oriented parallel walls, an anchor clip connected between the lower end of each of said rafters and the lower horizontal support, each of said anchor clips including a base plate and a leg, said base plate including means for rigidly mounting said base plate to the lower horizontal support and a hinge boss at one edge portion thereof, said leg including means for rigidly mounting said leg between the spaced walls of the rafters and a hinge boss at one edge portion thereof constructed to mate with the hinge boss of said base plate, a pivot pin extending through the hinge bosses of the base plate and the leg of each anchor clip to hingedly anchor the sloped wall structure to the lower horizontal support.

4,296,577

HELICAL STAIRCASE SUPPORT

Heinz G. Schuette, 26145 Shook, Mt. Clemens, Mich. 48045

Filed Oct. 22, 1979, Ser. No. 87,040
Int. Cl.³ E04F 11/00
U.S. Cl. 52—187 **6 Claims**



1. A helical staircase comprising:

a plurality of brackets for supporting stair treads;

each bracket including a first vertical tube having an upper end and a lower end;

a transverse member affixed the first vertical tube upper end;

a second vertical tube axially spaced from the first tube having an upper end and a lower end;

a horizontal member extending between tubes affixed at one end to the first tube upper end and affixed at another end to the second tube lower end;

a stair tread abutting said horizontal member longitudinally along a transverse central portion and abutting said transverse member; and

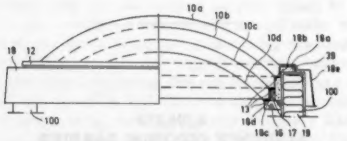
said brackets joinable with said first tube lower end abutting said second tube upper end.

4,296,578

SKYLIGHT APPARATUS

Heikki Keckman, It.Harjutie 11, 07900 Loviisa, Finland

Filed Jun. 12, 1979, Ser. No. 47,867
Claims priority, application Finland, Jun. 13, 1978, 780690; Jun. 13, 1978, 781893; Oct. 20, 1978, 783238
Int. Cl.³ E04B 7/18
U.S. Cl. 52—200 **14 Claims**



1. Skylight apparatus adapted to be located within a skylight aperture defined by aperture forming building frame components, comprising:

at least two dome-shaped light-transmitting window elements having outer dimensions which vary with respect to each other defining larger and smaller window elements, each of said window elements including peripherally extending outer support edge portions, said window ele-

ments being mounted in vertically spaced relationship one above the other at their respective peripheral support edge portions with the largest of said window elements being located at the uppermost position; and

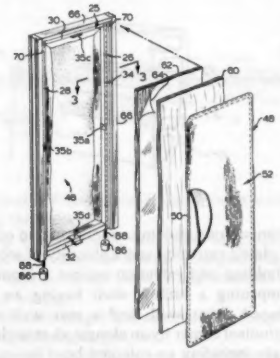
means for mounting said window elements in a manner such that the mutual spacing between regions adjacent to said peripherally extending outer support edge portions of vertically adjacent window elements are substantially equal to the mutual spacing between the central portions thereof and such that the spacing between at least the lowermost window element and the next vertically adjacent window element is located within the skylight aperture forming building component, said mounting means including a frame structure defining a plurality of vertically spaced supporting portions, each of said supporting portions extending around the inner periphery of said supporting structure and wherein each of said plurality of supporting portions extends inwardly to a greater extent than the supporting portion located immediately thereabove, said supporting portions comprising surfaces which slope downwardly and inwardly and wherein said peripheral edge support portions of said window elements extend continuously upwardly and outwardly at a slope which substantially corresponds to the slope of said frame supporting portions, and wherein a plurality of said vertically spaced window elements are provided, each having a dimension which varies with respect to the other of said window elements, said window elements being mounted at their peripheral edge support portions on corresponding supporting portions of said frame structure with the smallest window element being the lowest of said window elements and the largest window element being uppermost, and wherein said frame structure is adapted to be mounted on said skylight aperture forming building frame component.

4,296,579

SCREEN PANEL

Norman Proud, 16 West St., Oakville, Ontario, Canada (L6L 2Y6)

Filed May 9, 1979, Ser. No. 37,563
Int. Cl.³ E04B *2/72*; A47G *5/00*
U.S. Cl. 52—239 **6 Claims**



1. A screen panel comprising:

(a) a frame for said panel, said frame having a closed perimeter and defining front and rear planar surfaces spaced apart in a front to rear direction and extending in parallel lateral planes.

(b) a plurality of clips fixed to said frame and spaced around the perimeter of said frame, some of said clips being associated with said front surface and some of said clips being associated with said rear surface, each clip having a support portion extending in said front to rear direction beyond its associated front or rear surface and a retainer portion extending from the outer end of said support portion and directed outwardly in a direction having a component parallel to a said lateral plane,

(c) two sleeves, each sleeve having:

(i) a self supporting subframe formed from a resilient wire rod which defines a closed perimeter,

(ii) a fabric material extending across said subframe and covering said wire rod,

(d) said wire rod of one sleeve being fitted over said support portions of said clips associated with said front surface and said wire rod of the other sleeve being fitted over said support portions of said clips associated with said rear surface,

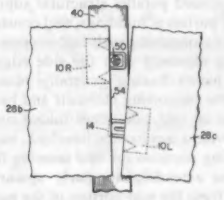
whereby a said sleeve may be removed from said panel by deforming a portion of its wire rod in a direction generally laterally outwardly to move such portion clear of the retaining portion of a clip on which such portion is fitted, and then moving such portion outwardly in a front to rear direction, away from said frame.

4,296,580

WALL CONSTRUCTED FROM PANELS HELD IN POSITION WITH THE AID OF CONCEALED FASTENERS AND CONCEALABLE FASTENERS FOR USE IN ASSEMBLING SUCH WALL

Roger N. Weinar, 19 Parkside Ave., Hamburg, N.Y. 14075

Continuation-in-part of Ser. No. 947,078, Sep. 29, 1978, Pat. No. 4,221,095, which is a continuation-in-part of Ser. No. 736,425, Oct. 28, 1976, Pat. No. 4,117,644. This application Jul. 23, 1980, Ser. No. 171,331
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—281 **22 Claims**



1. A wall or partition comprising first and second coplanar end-abutting panels, substantially invisibly secured together along a joinder line at a wall framing member by a first series of a plurality of spaced apart fasteners joined to the first panel at the abutting end thereof and held to the framing member, and a second series of spaced apart fasteners joined to the second panel at the abutting end thereof and with parts of each of the fasteners of each of both series of fasteners extending parallel to said panels at concealed back major surfaces thereof, said fasteners of the second series of fasteners being so located as to avoid contact with said fasteners of the first series of fasteners, and said extending parts of said fasteners of the second series of fasteners, when the wallboard panels are in coplanar end-abutting relationship, contacting the back major surface of the first panel and, in conjunction with the framing member, the first series of fasteners, means for holding the fasteners of the first series to the framing member, and the first panel, preventing said second panel from moving away from said framing member and from said first panel in a direction having a component at right angles to the plane of the panels, which fasteners of the first series are each comprised of directly connected plate and tongue portions which are essentially flat, with the plate portion contacting the first panel and the tongue portion contacting the second panel, a pair of web portions extending only from the plate portion and installed between first and second panel ends, a pair of impaling portions extending from said web portions and overlying said plate portion and penetrating said first panel at an abutting end

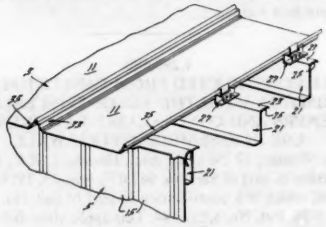
thereof, a framing contacting part of the fastener, and a panel contacting part of the fastener, with such framing contacting and panel contacting parts being connected by a wall member or plurality of wall members, which space(s) them apart and strengthen(s) the fastener, and which fasteners of the second series are of the same structure as those of the first series.

4,296,581

ROOFING STRUCTURE

Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.

Continuation-in-part of Ser. No. 875,524, Feb. 6, 1978, Pat. No. 4,213,282. This application Jul. 31, 1979, Ser. No. 62,300
The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.
Int. Cl.[3] E04D *1/00, 1/34*
U.S. Cl. 52—520 **5 Claims**



1. In a paneling construction adapted to be installed by attachment to spaced parallel structural supporting elements such as the roof purlins of buildings, said construction comprising a plurality of elongated panels laid over and transversely to such supporting elements with the side edges of the panels abutting, said panels having generally planar mid-portions lying close to the supporting elements and having upstanding seaming flanges on said side edges folded over and crimped together to provide a mechanical interlock, each of said panels having supporting portions for said seaming flanges, said supporting portions extending angularly upwardly away from each other and from the mid-portion of the panel whereby the supporting portions of adjacent panels define a tunnel-like area and clip means securing the panels to the structural supporting elements, each clip means including a base member, attaching means rigidly securing said base members and clip means to a structural supporting element in the tunnel-like area defined by the supporting portions of adjacent panels, said construction being characterized by:

A. A rim portion incorporated in an intermediate part of each of the supporting portions of each panel, said rim portions lying substantially in a common plane and extending inwardly toward one another from and substantially perpendicularly to the seaming flanges,

B. The base member of each of said clip means having an upstanding column with a top portion closely underlying and supporting said rim portions of the adjacent panels,

C. A holding portion secured to the base member of each clip means and preventing outward movement of the holding portion, said holding portions projecting upwardly from the base member between, and being folded over and crimped together with, the seaming flanges of the adjacent panels to prevent relative movement therebetween,

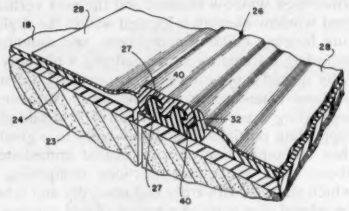
whereby said holding portion and the top portion of the base member co-act with the seaming flanges and with said attaching means to prevent movement of the seaming flanges and of the supporting portions of the panels toward and away from the structural supporting elements and also to hold the holding portion against movement toward the base member.

4,296,582

CONSTRUCTION SYSTEM AND FASTENERS THEREFORE

Harold G. Simpson, and Michael W. Davis, both of Oklahoma City, Okla., assignors to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.

Filed Dec. 31, 1975, Ser. No. 645,566
Int. Cl.[3] E04C *1/10*
U.S. Cl. 52—590 **19 Claims**



1. A fastener adapted to interlock with another similar fastener to provide a seal between the fastener, said fastener including a body portion including a plurality of male and female members for interlocking engagement with similar such members of said similar fastener, said fastener being made by a process including the steps of:

mixing and combining a fastener material including Hypalon, and

manufacturing the fastener from said material; and

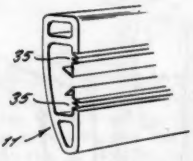
utilizing a dust cap prior to connection of said fastener to said similar such fastener to transfer a lubricant to said fastener while protecting the fasteners from an accumulation of dirt.

4,296,583

SLAP TRIM INTERIOR MOLDING

Louis D. Egenlauf, 12634 Saginaw Ave., Chicago, Ill. 60633

Filed Aug. 27, 1979, Ser. No. 69,889
Int. Cl.[3] E04C *2/38*
U.S. Cl. 52—717 **1 Claim**

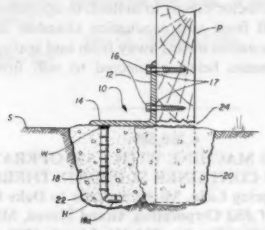


1. A slap trim interior molding, comprising, in combination, an elongated plastic extrusion and a plurality of separate holding pins for holding said extrusion against a room wall; said extrusion comprising a hollow shell having an elongated, decorative-shaped, front wall, and a rear wall intercepted along its longitudinal center by an elongated, straight slot; each said holding pin including an enlarged head having a groove on its opposite sides, for elongated edges of said extrusion rear wall along said slot to snap-fit therein; a portion of said rear wall adjacent each said slot edge being thin-walled respective to a remaining thicker-walled portion of said rear wall, and an angularly inclined flange extending inwardly into said shell from each said slot edge, and a plurality of longitudinally extending, thin-walled accordian pleats are formed between each said thin-walled portion and said thicker-walled portion of said rear wall, for flexing of any portion of said slot edges in a transverse direction either toward or away from each other.

4,296,584
METHOD FOR OFFSET ANCHORING A FENCE POST

Bernard J. Lempa, Jr., 8422 Carvel La., Houston, Tex. 77036

Filed Sep. 4, 1979, Ser. No. 71,988
Int. Cl.[3] E02D 27/42
U.S. Cl. 52—742 7 Claims



1. A method of reanchoring a fence post which is no longer firmly supported in the ground without disturbing the existing post foundation or the fence structure associated therewith comprising the steps of:

digging a hole in said ground adjacent said post foundation;

attaching to the lower end of said post and next to said post foundation the vertical leg of a bracket which also has a horizontal leg from which depends an anchor member for disposition within said hole;

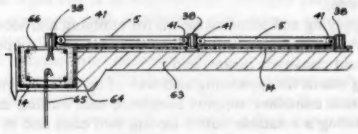
pouring a concrete mixture into said hole and around said anchor member to a level substantially flush with said horizontal bracket leg; and

allowing said concrete mixture to set without disturbing said post and bracket.

4,296,585
PERMANENT WEATHER COVERS

Dante Bini, 48 Chandos St., Crows Nest, N.S.W. 2065, Australia

Filed May 9, 1979, Ser. No. 37,925
Claims priority, application Australia, May 30, 1978, PD4545
Int. Cl.[3] E04B 1/34
U.S. Cl. 52—745 5 Claims



1. A method of forming a self-supporting domed space frame comprising the steps of:

(a) taking a plurality of elongated longitudinal elements, each of said elements having a longitudinal axis and opposed ends and at last some of said elements being extensible and having

(i) a minimum length and an operative length greater than said minimum length, and

(ii) arresting means to prevent a reduction in the length of the element to a value less than said operative length, said arresting means being automatically operable when the element has had its length increased to a value not less than said operative length;

(b) assembling said elements into a substantially planar grid, wherein

(i) an end of each element is pivotally connected to an end of the next adjacent element for pivotal movement about a horizontal axis extending transversely of said elements, and

(ii) the elements are free to twist about the longitudinal axes thereof;

(c) anchoring elements of the grid at the grid periphery in a manner permitting such anchored elements to swing upwardly;

(d) locating an inflatable membrane in lifting relationship to the grid;

(e) inflating the membrane to lift the grid to a point wherein all of the extensible elements have been extended to at least their respective operative lengths;

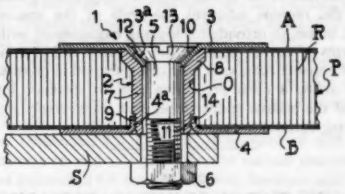
(f) locking at least certain of the elements against return pivotal movement about said transversely extending axes; and,

(g) releasing the inflation pressure from the membrane to permit said gridwork to be self-supporting.

4,296,586
FASTENING DEVICE FOR A HONEYCOMBED PANEL EMPLOYED IN PARTICULAR IN AERONAUTIC STRUCTURES

Bernard M. Heurteux, Verviers, Belgium, assignor to Shur-Lok International, S.A., Petit-Rechain, Belgium

Filed Oct. 30, 1979, Ser. No. 89,459
Claims priority, application France, Nov. 6, 1978, 78 31314
Int. Cl.[3] E04C 2/54
U.S. Cl. 52—787 2 Claims



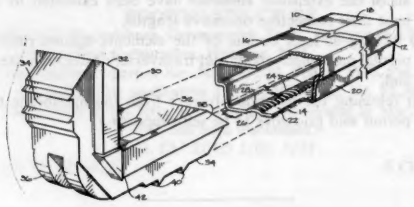
1. A fastening device for mounting in a marginal region of a panel comprising a honeycombed network and skins respectively covering opposed large sides of the network and imparting a required stiffness to the panel, said device comprising a sleeve for placing in an opening formed transversely in the panel, the sleeve having opposed end portions of a given shape, a fastening member extending through the sleeve, and two strengthening means for contributing to the connection of the sleeve with the skins of the panel, said strengthening means comprising thin plates for respectively adhering to the skins of the panel in a region which surrounds the opening formed in the panel and having an area which distinctly exceeds the cross-sectional area of the sleeve, each plate comprising an aperture for substantial alignment with the sleeve, an edge portion of each plate defining the plate aperture substantially conforming to said given shape of the corresponding end portion of the sleeve so as to ensure the transmission of transverse forces exerted on the sleeve by said fastening member to an area of the skins corresponding to at least the extent of said plates, the aperture of at least one of the plates being bordered by an annular flange obtained by deformation of the plate and extending in a direction perpendicular to the general plane of the plate, the corresponding end portion of the sleeve having a bearing surface on which said flange is an interference fit, and at least one of the plates having a flange folded at a right angle for bearing against a lateral edge of the panel.

4,296,587

SPACER FOR DOUBLE GLAZED WINDOWS INCORPORATING INTERLOCK MEANS

Gunter Berdan, Weston, Canada, assignor to Custom Rollforming Company Limited, Weston, Canada

Filed Nov. 27, 1979, Ser. No. 97,773
Int. Cl.³ E04C *2/38*
U.S. Cl. 52—788 **6 Claims**



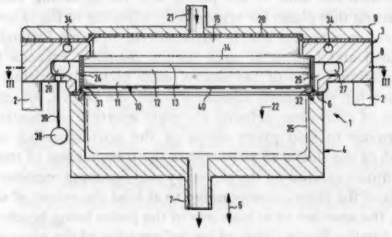
1. A spacer tube for a hermetically sealed double glazed window, the spacer tube being formed from an elongated strip of metal bent into a hollow elongated tubular shape, the spacer tube having opposing side wall portions, a base extending between and connecting the side wall portions and a further wall spaced from the base, such further wall defining a region wherein the longitudinal edges of the strip extend toward each other, and wherein a surface of the spacer tube which faces into the interior of the spacer tube has a plurality of closely spaced ridges therein, said surface having said ridges therein being the interiorly facing surface of said base, the ridges being spaced apart in the lengthwise direction of the spacer tube and the individual ridges extending generally transversely of the longitudinal axis of the spacer tube, the ridges being located at least in the regions adjacent the ends of the spacer tube whereby, in use, to provide for locking engagement with teeth on the arms of corner pieces when inserted endwise into the ends of the spacer tube, said base being shaped in cross-section so as to define a crest projecting a short distance into the interior of the hollow spacer tube, said transversely disposed ridges being formed in said crest.

4,296,588

SEALING STATION OF VACUUM PACKAGING MACHINES

Artur Vetter, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 79,043
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1978, 2843894
Int. Cl.³ B65B *31/02*
U.S. Cl. 53—86 **18 Claims**



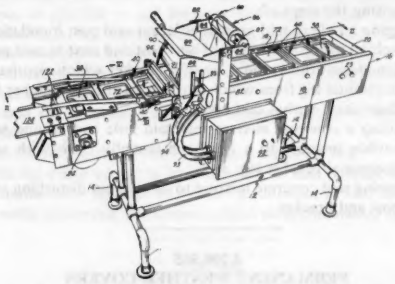
1. A vacuum packaging machine for producing sealed vacuum packages having an evacuating and sealing station comprising first and second station portions, a heatable sealing member in said first station portion, means for cooling a portion of said first station portion, a backing member in said second station portion, said sealing member and backing member being movable toward and away from each other, means for moving the sealing member and backing member toward and away from each other, an evacuating chamber defined by said first and second station portions, said evacuating chamber being connected with evacuating means through suction opening means and deflector means to deflect, in operation, a fluid stream sucked off from said evacuation chamber under the action of said evacuation means away from said sealing means, said deflecting means being connected to said first station portion.

4,296,589

PACKAGING MACHINE WITH CAM-OPERATED CUTTER AND CONTAINER SUPPORTS THEREFOR

Gary L. Kruse, Spring Lake, Mich., assignor to Dake Corporation, Division of JSJ Corporation, Grand Haven, Mich.

Continuation-in-part of Ser. No. 904,216, May 9, 1978, Pat. No. 4,196,561. This application Aug. 23, 1979, Ser. No. 69,100
Int. Cl.³ B65B *7/28, 41/16*
U.S. Cl. 53—300 **14 Claims**



1. A packaging machine for applying and securing a web of material to containers comprising:

conveyor means for supporting and conveying containers in one direction along a path, said conveyor means including a plurality of spaced container support members mounted thereon;

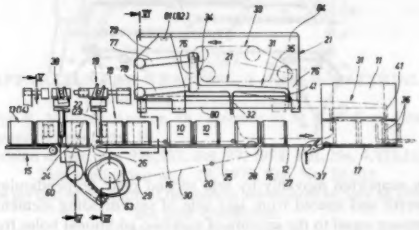
web applying and securing means for applying and securing a continuous web of material to the containers supported by said conveyor means; and

cutting means for separating said web of material intermediate said container support members; said cutting means including a rotatable cutter having two ends and at least three cutting edges equally spaced in fixed positions around the exterior thereof and extending across said conveyor means, support means for rotatably supporting said cutter transversely across and above said conveyor means, said support means including camming means at each of said two ends of said cutter for intermittently rotating said cutter in a circular path, said camming means being offset circumferentially from said cutting edges; said container support members each including at least two projecting means for engaging said camming means, at least one projecting means being aligned with one of said two camming means and at least the other projecting means aligned with the other of said two camming means whereby said cutter is intermittently rotated such that said cutting edges are rotated to a first position by said one projecting means engaging said one camming means and thereafter rotated through a second position between said container support members to sever said web of material therebetween by said other projecting means aligned with the other of said two camming means.

4,296,590
METHOD AND APPARATUS FOR CONVEYING SIX-PACK CONTAINERS TO CARTON BLANK

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Bremen, Fed. Rep. of Germany

Continuation of Ser. No. 955,827, Oct. 30, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 207,040
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750533
Int. Cl.[3] B65B *35/30*
U.S. Cl. 53—531 16 Claims



1. An apparatus for forming and conveying packs of articles, particularly bottles and cans, to a packing container, comprising:

(a) a feed conveyor (**15**) for continuously supplying article packs (**10**) to an input end of a transport path of the apparatus in two distinct lines (**13,14**),

(b) means including a stopping device (**38**) and a beginning conveyor (**19**) disposed in the transport path following the feed conveyor for receiving the article packs, separating them into plural pack groups (**18**), and delivering the groups to an input end of an intermediate conveyor (**20**) disposed in the transport path following said means, said beginning conveyor (**19**) accelerating the groups (**18**) to the speed of said intermediate conveyor (**20**),

(c) an end conveyor (**21**) disposed in the transport path following the intermediate conveyor for receiving the pack groups therefrom and transporting them to a final stop position at a packing station, said end conveyor comprising:

(1) a movable slide member (**31**) disposed above the transport path,

(2) means for lowering the slide member,

(3) a pusher plate (**32**) depending downwardly from the slide member for engaging the rear ends of pack groups upon the lowering of the slide member,

(4) a counterstop (**41**) spaced from the pusher plate and depending downwardly from the slide member for engaging the front ends of pack groups,

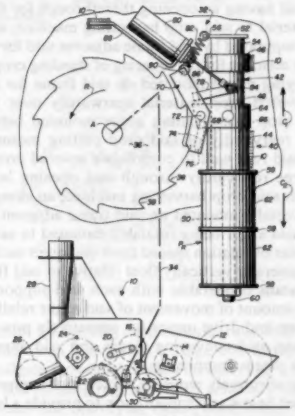
(5) means for driving the slide member at a higher horizontal conveying speed than the intermediate conveyor to thereby accelerate pack groups engaged by the slide member away from those behind to provide sufficient handling time at the stop position before the next pack groups arrive, and

(d) a yieldable end stop (**36**) for determining the stopping position of the pack groups, said end stop being operable to move toward the approaching groups and then be driven back with the groups to said stopping position.

4,296,591
DAMPED APPARATUS FOR QUICK-STOPPING ROTATING MEMBERS

Wayne B. Martenas, New Holland; Edward H. Priepke, Stevens, and Robert A. Wagstaff, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Oct. 1, 1980, Ser. No. 192,783
Int. Cl.[3] A01D *75/18*
U.S. Cl. 56—10.3 9 Claims



1. A damped apparatus for quick-stopping a rotating member comprising:

a reaction member supported adjacent said rotating member, said reaction member including a slide and a slide support, said slide movable relative to said support;

a stop carried by said slide, said stop movable relative to said slide between a first position, free of engagement with said rotating member, and a second position in engagement with said rotating member;

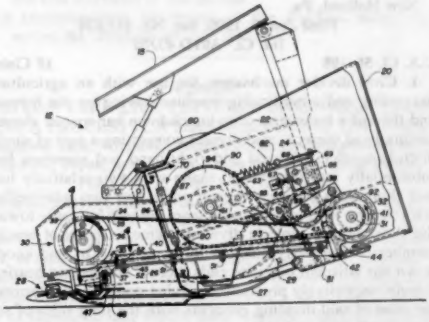
means connected for damping movement of said slide in response to said stop being in said second position; and

means connected for moving said stop between said first and second positions.

4,296,592
AUGER FLOATATION LIMIT

Irwin D. McIlwain, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Nov. 3, 1980, Ser. No. 203,084
Int. Cl.[3] A01D *41/12*
U.S. Cl. 56—14.4 6 Claims



1. In a crop harvesting header attachable to a mobile crop

harvesting machine to initiate the crop harvesting process, said header having a frame; opposing first and second side sheets supported by said frame, said side sheets being generally vertically inclined and positioned substantially parallel to the direction of travel of said crop harvesting machine; a floor member extending between said side sheets substantially perpendicular thereto, said floor member having a forward edge; a substantially vertical rear wall connected to said floor member rearwardly of said forward edge and extending between said side sheets generally transverse to said forward direction of travel; said rear wall having an opening therethrough for the passage of crop material to said crop harvesting machine; a crop cutting means supported by said frame adjacent said forward edge of said floor member for the severing of standing crop material; crop conveying means mounted on said frame for the movement of severed crop material rearwardly over said floor member; a crop consolidating auger mounted between said side sheets rearwardly of said crop cutting means and forwardly of said rear wall to consolidate severed crop material and discharge rearwardly through said opening in said rear wall towards said crop harvesting machine; an elongated support arm pivotally mounted on said frame adjacent each said side sheet, said auger being rotatably mounted to said support arm at a center of rotation spaced from said pivot such that said auger can generally vertically float relative to said floor member; limit means cooperable with each said support arm for limiting the amount of movement of said auger relative to said floor member; and drive means for operatively powering said cutting means, said conveying means and said auger, an improved limit means comprising:

a first stop selectively movably affixed to the respective said side sheet below said support arm to provide a lower limit for the movement of said auger;

a second stop selectively movably affixed to said respective side sheet above said support arm to provide an upper limit for the movement of said auger;

a vertical adjusting means for selectively moving said first stop in a generally vertical direction so as to position said lower limit of movement of said auger at a desired location relative to said floor member; and

a strap mechanism interconnecting said first and second stops and including a locking means cooperable therewith to selectively lock said first and second stop in a selective position relative to said side sheet, said strap mechanism simultaneously providing equal movement of both said first and second stops such that the amount of flotational movement permitted to said auger does not vary when said vertical adjusting means is manipulated to change the lower limit of movement of said auger.

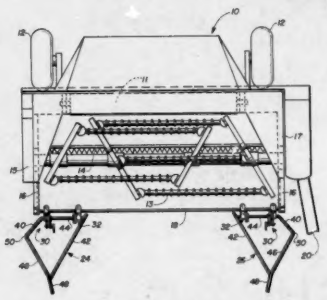
4,296,593

UNIVERSAL CROP DIVIDER MECHANISM

Bryant F. Webb, Ephrata; Stanley J. Makofka, New Holland; Emmett G. Webster, New Holland, and Edward A. Blakeslee, New Holland, all of Pa., assignors to Sperry - New Holland, New Holland, Pa.

Filed Jun. 9, 1980, Ser. No. 157,624
Int. Cl.[3] A01D *45/02*
U.S. Cl. 56—98 **15 Claims**

1. Crop divider mechanism for use with an agricultural harvesting and conditioning machine having on the forward end thereof a transverse crop knockdown bar spaced above a cutting head thereon, said divider comprising a pair of similar interchangeable left-hand and right-hand rod members bent substantially into trapezoidal shape with two relatively long and short sides parallel to each other and two intermediate sides sloping toward each other from the said long side toward the short side to provide dividing elements, pairs of bracket members respectively adapted to be attached to said knockdown bar adjacent opposite ends thereof and having bearings therein respectively pivotally receiving one of said intermediate sides of said dividing elements with the long sides of said elements facing each other in spaced relationship along said knockdown bar, similar positioning plates respectively fixed to one of said brackets of each pair and having a first hole through which said one of said intermediate sides of said elements extends and two additional positioning holes spaced even distances from said first hole substantially along axes at ninety degrees to each other relative to said first hole, a second plate fixed to said one of said intermediate sides of said dividing elements adjacent said one of said brackets, and a positioning



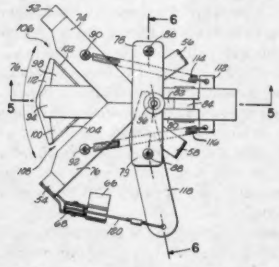
pin supported movably by said second plate perpendicularly thereto and spaced from said side of said dividing element a distance equal to the spacing of said two additional holes from said side of said element and said positioning pin being selectively positionable within one of said two additional positioning holes and thereby support said dividing elements selectively in horizontal operative or vertically upward inoperative positions relative to said knockdown bar.

4,296,594

FRUIT PICKER

Richard J. Faulconer, P.O. Box 164, Barstow, Calif. 92311

Continuation-in-part of Ser. No. 92,321, Nov. 8, 1979. This application Jun. 3, 1980, Ser. No. 156,045
Int. Cl.[3] A01D *46/24*
U.S. Cl. 56—336 **12 Claims**



1. A fruit picker comprising

an elongated tubular member having an inlet and an outlet at opposite ends thereof defining a bore therethrough, and a plurality of perforations in the wall surrounding said bore;

a handle affixed to the exterior of said tubular member, and a lever mounted on said handle and spaced therefrom a distance such that said handle and said lever may be gripped in one hand and the lever squeezed toward the handle;

a cover member mounted on said tubular member in overlying relation to said inlet and having an outwardly opening notch;

at least one bladeguard formed on one side of said notch;

a knife comprising a shank and at least one blade confronting

said bladeguard, and means mounting said knife on said cover member for reciprocal slidable movement of said knife in a plane normal to the axis of said tubular member along a line bisecting said notch;

force transmitting means linking said lever and said knife mounting means for moving said knife from a first position wherein said blade is spaced from said bladeguard into a second position wherein said blade is received in said bladeguard upon actuation of said lever; and

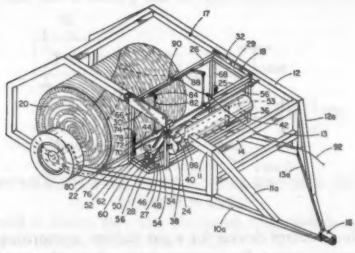
resilient means connecting said knife and said cover member for moving said knife from said second to said first position upon release of said lever.

4,296,595

APPARATUS FOR WRAPPING A COVER MATERIAL AROUND ROUND BALES

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Division of Ser. No. 928,507, Jul. 27, 1978, Pat. No. 4,173,112.
This application Aug. 29, 1979, Ser. No. 70,621
The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **9 Claims**



1. In a round baler of the type having a bale forming mechanism for transport over a field of cut material to gather and form the material into a round bale, the improvement of apparatus for applying a cover sheet over the round bale during the bale forming operation, said improvement comprising in combination:

(a) a wrapping material roll storage member affixed to the baler forward of the bale forming mechanism, said roll storage member being oriented to position an end of a sheet of wrapping material on the roll member in the path of the cut material for wrapping the bale as the bale is being formed;

(b) drive means for the storage member for removing the sheet of wrapping material from the roll member and directing the end of said sheet along the ground for gathering by the bale forming mechanism about the outside surface of the formed bale;

(c) means forward of the bale forming mechanism for terminating flow of cut material to the bale forming mechanism; and

(d) means for cutting the wrapping material intermediate the bale forming mechanism and the roll storage member whereby the sheet may be wrapped about the bale and cut to permit the end of the sheet to be held against the ground by the bale thereby providing

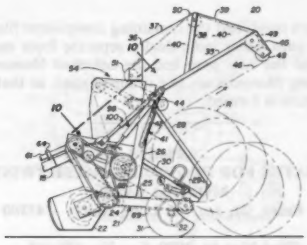
means for holding a cut end of sheet material to a bale formed by the bale forming mechanism.

4,296,596

AUTOMATIC BALE EJECTION DRIVE

T. William Waldrop, New Holland, and Willis R. Campbell, Ephrata, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 25,161, Mar. 29, 1979, Pat. No. 4,208,862.
This application Jan. 16, 1980, Ser. No. 112,600
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **6 Claims**



1. A method for forming crop material rolls from a windrow of preformed crop material in a large roll forming machine having a tailgate movable between an open and a closed position and a roll forming region defined generally by upper bale forming means and conveying means comprising the steps of:

(a) moving the machine along and across the windrow of crop material;

(b) picking the crop material up from the windrow and directing it into the roll forming region;

(c) forming the crop material into a roll of crop material of predetermined length and predetermined diameter;

(d) wrapping the bale with a binding material about its periphery upon the bales reaching the predetermined diameter;

(e) raising the tailgate along a predetermined path of travel;

(f) automatically disengaging the drive to the upper bale forming means as the tailgate is raised along the path of travel to stop the upper bale forming means movement in a first direction and then automatically reversing the movement to a second direction of travel of the upper bale forming means as the tailgate continues to be raised along the path of travel to cause the formed bale to be ejected from the roll forming region;

(g) lowering the tailgate upon ejection of the bale;

(h) automatically disengaging the drive to the upper bale forming means as the tailgate is lowered along the path of travel to stop the movement in the second direction of travel and then automatically reversing the movement to the first direction of travel; and

(i) recommencing movement of the machine along and across the windrow of crop material.

4,296,597

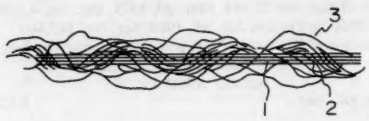
COTTON YARN-LIKE TEXTURED COMPOSITE YARN AND A PROCESS FOR MANUFACTURING THE SAME

Masayuki Tani; Mitsuhiko Okui, and Mitsuo Matsumoto, all of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 6, 1980, Ser. No. 118,987
Claims priority, application Japan, Jul. 24, 1979, 54-93189
Int. Cl.³ D02G *3/36, 3/38*
U.S. Cl. 57—205 **15 Claims**

1. A false twist textured composite yarn having the appearance and touch of a cotton yarn, said textured composite yarn comprising a core yarn and a sheath yarn composed of a plurality of filaments, said sheath yarn wrapping around the core yarn with a length difference ratio of at least 15%, wherein a part of said filaments of the sheath yarn wrap around the core

yarn with a successive alternate twist, while said part of filaments being substantially cohered and at least partially adhered to the core yarn by fusion of the core yarn at the boundary region where the component filaments of the sheath yarn and



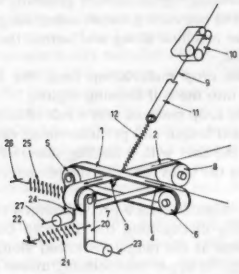
the core yarn meet, and the remaining component filaments of the sheath yarn being individually separate from each other wrap around the core yarn and the coherent filaments while the remaining filaments are in a crimped state, so that a three-layer structure is formed.

4,296,598

APPARATUS FOR PROVIDING FALSE TWIST TO MOVING YARN

Jean-Louis Faure, 21, rue des Lilas, Mably - 42300 Roanne, France

Filed May 16, 1980, Ser. No. 150,642
Claims priority, application France, May 22, 1979, 79 13915
Int. Cl.³ D02G 1/06; D01H 7/92
U.S. Cl. 57—284 **10 Claims**



1. Apparatus for providing a false-twist by friction to a moving yarn, comprising

a first endless apron,

a second endless apron positioned at an angle with respect to said first apron, at least one strand of said second apron being in contact with a strand of said first apron, the moving yarn being directed to pass between said first strand and said second strand in the zone of contact to a downstream location,

a first set of rollers fitting said first apron, and

a second set of rollers of external diameter fitting said second apron to permit said second apron to pass inside said first apron,

whereby relative movement of said contacted strands of said first and second aprons impart false-twist to the yarn in the contact zone.

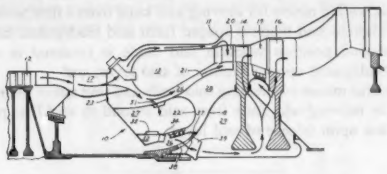
4,296,599

TURBINE COOLING AIR MODULATION APPARATUS

Arthur P. Adamson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 30, 1979, Ser. No. 25,300
Int. Cl.³ F02C 7/18
U.S. Cl. 60—39.23 **13 Claims**

1. An improved turbomachine cooling air delivery system of the type having a source of cooling air and an air delivery channel for fluidly connecting the air delivery system to machine components to be cooled, wherein the improvement comprises a plurality of valves disposed in mutually parallel relationship in the air delivery channel and means for automatically operating each of said valves individually in response to



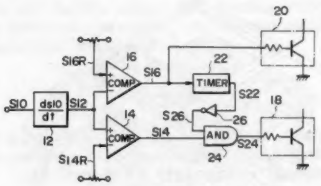
predetermined conditions of said cooling air for thereby selectively varying the amount of cooling airflow in said air delivery channel.

4,296,600

FUEL CONTROL DEVICE FOR A GAS TURBINE

Toshimi Abo, and Hidetoshi Kanegae, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 30, 1980, Ser. No. 116,866
Claims priority, application Japan, Feb. 6, 1979, 54-12615
Int. Cl.³ F02C 9/32
U.S. Cl. 60—39.28 R **6 Claims**



1. A fuel control device for a gas turbine, comprising:

(a) sensing means for sensing the load on the turbine to output a first signal representative of the rate of change thereof;

(b) increase means responsive to the first signal for temporarily increasing the amount of fuel supplied to the turbine when the rate of increase of the load with time is higher than a reference value;

(c) decrease means responsive to the first signal for temporarily decreasing the amount of fuel supplied to the turbine when the rate of decrease of the load with time is higher than a certain predetermined value; and

(d) reducing means for reducing the amount of increase of fuel supplied by the increase means during a certain predetermined time interval after the end of functioning of the decrease means.

4,296,601

ELECTRONIC FUEL CONTROL SYSTEM

Anthony N. Martin, Simsbury, Conn., assignor to Otis Elevator Company, Hartford, Conn.

Filed Aug. 23, 1979, Ser. No. 69,142
Int. Cl.³ F02C 9/42
U.S. Cl. 60—224 **7 Claims**

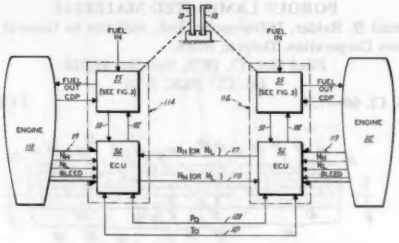
1. A fuel control system for gas turbine engines, comprising:

a hydromechanical fuel section for providing fuel flow to the engine at commanded power settings and including means for augmenting said fuel flow in response to a fuel flow modifying signal, and

signal processing means for providing said fuel flow modify-

ing signal in response to signals applied thereto, said signals reflecting power setting, engine speed and ambient and engine conditions,

characterized in that said processing means comprises means for providing a correction signal which is summed with an engine speed signal, said correction signal being selected from a plurality of signals each reflecting a maximum



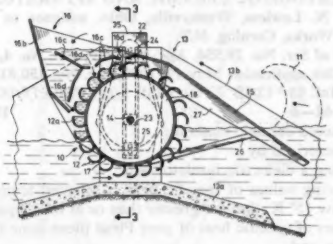
engine speed, at least one of said signals being related to the power setting, engine speed and any difference between engine speed and a scheduled engine speed for the particular power setting in such a way as to reflect the required change, if any, in engine speed in order to produce, between actual engine speed and maximum engine speed, a ratio which is the same as the ratio between the actual power setting and the maximum power setting.

4,296,602

APPARATUS FOR EXTRACTING ENERGY FROM WATER WAVES

Marwood J. Hales, Box 116, Redmond, Utah 84652, and Cameron L. Thorpe, Axtell, Utah 84621

Filed Jan. 10, 1980, Ser. No. 110,932
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—398 **11 Claims**



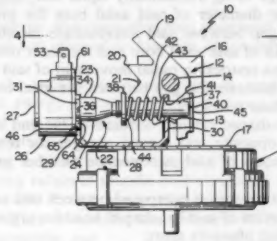
1. Apparatus for extracting energy from water waves, comprising an elongate water-wheel; foundation means rotatably mounting the water wheel and anchoring it to the bottom of a body of water in which waves are produced, so that at least a portion of the wheel is above the surface of said body of water; a ramp extending substantially the length of the wheel, shielding the wave side of the wheel from the wave impact, and directing water of the wave upwardly over the top of the wheel to imapct said water wheel on the side thereof removed from the wave and to effect rotation thereof; and means for extracting energy from the rotation of the wheel.

4,296,603

TEMPERATURE RESPONSIVE PISTON AND CYLINDER UNIT HAVING A HEATER CARRIED THEREBY

Siegfried E. Manecke, and Thomas M. Buckshaw, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 856,404, Dec. 1, 1977, Pat. No. 4,206,780. This application Jan. 28, 1980, Ser. No. 116,318
Int. Cl.³ F03G *7/06*
U.S. Cl. 60—528 **9 Claims**



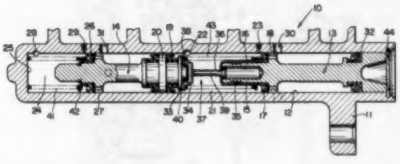
1. In a temperature responsive piston and cylinder unit wherein the piston thereof is extended relative to the cylinder thereof when the unit is heated and said piston is adapted to be retracted into said cylinder when the unit is cooled, an annular electrical heater means being carried in substantially a concentric manner on said cylinder of said unit for heating said unit to extend said piston thereof when said heater means is activated, the improvement wherein said heater means comprises a pair of telescoping annular electrical insulating members telescoped on said cylinder of said unit, and an electrical heater member disposed between said insulating members to be energized by having an electrical current passed therethrough.

4,296,604

TANDEM MASTER CYLINDER

Jiro Kizaki, and Takashi Fujii, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 966,596, Dec. 5, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,620
Claims priority, application Japan, Dec. 5, 1977, 52-163754
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **2 Claims**



1. A tandem master cylinder comprising:

a. a body having an axial bore therein;

b. a first plunger sealingly and slidably fitted within said axial bore;

c. a second plunger sealingly and slidably fitted within the axial bore and being axially spaced from said first plunger for defining a first chamber between said first and second plungers, and being axially spaced from the end of said body remote from said first plunger for defining a second chamber between said body and said second plunger, said second plunger including a reduced diameter flange at its axial end proximate said first plunger and a protrusion extending from the central portion of said flange;

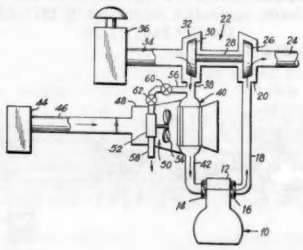
d. first seal means for sealing said first chamber;
e. second seal means for sealing said second chamber;
f. an intermediate member disposed between and movable with respect to said first and second plungers for defining the distance between said plungers, said member including a stick-shaped stem having a head portion secured to one end thereof in slidable engagement with an axial hole in said first plunger and having a hat-shaped head secured to the other end thereof movably abutting said flange and including a centrally located recess complementary to and movably seated over said protrusion on said second plunger, the outer diameter of said hat-shaped head and said flange being substantially equal and being less than the inner diameter of said axial bore for providing an annular gap between said intermediate member and the inner wall of said axial bore and the inner dimensions of said recess restricting radial movement of said hat-shaped head to maintain the gap between the axial bore and the intermediate member;
g. a sleeve-shaped retainer secured to the end of said first plunger opposite said second plunger for retaining said head portion of said intermediate member in said axial hole;
h. a first return spring interposed between said retainer and a seat portion of said hat-shaped head for urging said first and second plungers apart;
i. a second return spring having a setting load smaller than said first return spring disposed in said second chamber for urging said second plunger towards said first plunger;
j. a first compensating port for fluid communication with said first chamber being opened and closed by said first seal means during axial movement of said first plunger; and
k. a second compensating port for fluid communication with said second chamber being opened and closed by said second seal means during axial movement of said second plunger.

4,296,605

COMPRESSION RELIEF RETARDERS FOR SUPERCHARGED INTERNAL COMBUSTION ENGINES

Robert B. Price, Manchester, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Filed Feb. 11, 1980, Ser. No. 120,557
Int. Cl.³ F02B 37/00
U.S. Cl. 60—599 **20 Claims**



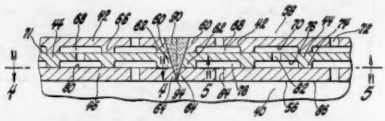
1. In an engine braking system of the gas compression relief type including an internal combustion engine having inlet and exhaust manifolds, an exhaust gas driven supercharger communicating with said inlet and exhaust manifolds respectively through inlet and exhaust ducts, an air-to-air intercooler communicating with said inlet duct and driven by a turbofan powered by air extracted from said inlet duct through a by-pass duct, engine exhaust valve means, engine exhaust valve opening means to open said engine exhaust valve means near the end of the compression stroke of said engine and electrical circuit means to control said engine exhaust valve opening means, the improvement comprising normally open control valve means located in said by-pass duct and solenoid means mechanically interconnected with said control valve means and electrically interconnected with said electrical circuit means whereby actuation of said electrical circuit means excites said solenoid means and moves said normally open control valve to a closed position to inhibit the flow of air through said by-pass duct.

4,296,606

POROUS LAMINATED MATERIAL

Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1979, Ser. No. 85,818
Int. Cl.³ F02C 7/18
U.S. Cl. 60—754 **3 Claims**



1. A porous laminated metal fabrication for a high temperature gas turbine engine component comprising first and second walls each having plural lamina with a free edge portion thereon, each of said first and second walls having a first lamina with a surface having a first preformed hole pattern therein, each of said first and second walls including a second lamina bonded to said first lamina, said second lamina having a surface with a second preformed hole pattern therein to form a tortuous air flow path through said first and second walls for cooling the metal therein, said wall holes directing coolant flow to form an air barrier on one of the lamina surfaces, each of said lamina having a solid metal section formed therein between said holes and said edge portions to define a weldable region of uniform metal density throughout a predetermined width between said first and second walls, a weld in said weldable region connecting said edge portions and having a width limited to the width of said region of uniform metal density whereby air flow through the first and second walls is free to flow through the full extent of all the preformed hole patterns in said lamina thereby to maintain full coolant flow therethrough during gas turbine engine operation.

4,296,607

CRYOGENIC CERAMIC AND APPARATUS

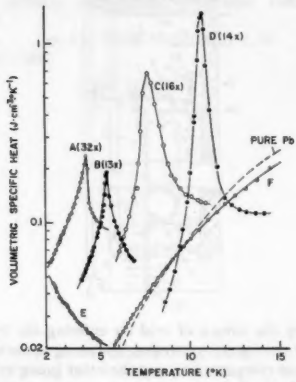
William N. Lawless, Westerville, Ohio, assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 29,554, Apr. 13, 1979, Pat. No. 4,231,231. This application May 19, 1980, Ser. No. 150,810
Int. Cl.³ C04B 35/00; F25B 9/00; F28D 17/00
U.S. Cl. 62—6 **18 Claims**

1. Sintered ceramic material:
(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with a composition defined by the molar formula ANb_2O_6 wherein A is selected from one or both of Mn and Ni ions.

8. In cryogenic refrigeration apparatus comprising
a load to be refrigerated,
a refrigerant adapted to refrigerate the load at temperatures below 15° K.,
thermal energy absorbing elements associated with the refrigerant and adapted to function at temperatures below 15° K.,
wherein the improvement comprises at least one of the thermal energy absorbing elements being composed of sintered ceramic material:

(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with



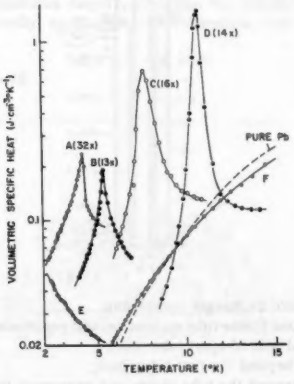
a composition defined by the molar formula AB_2O_6 wherein
A is selected from one or both of Mn and Ni ions alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is ion or ions of Mn and Ni, and
B is selected from one or both of Nb and Ta ions.

4,296,608

CRYOGENIC CERAMIC AND APPARATUS

William N. Lawless, Westerville, Ohio, assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 29,554, Apr. 13, 1979, Pat. No. 4,231,231. This application May 22, 1980, Ser. No. 152,404
Int. Cl.[3] **C04B** *35/00;* **F25B** *9/00;* **F28D** *17/00*
U.S. Cl. 62—6 **19 Claims**



1. Sintered ceramic material:
(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with a composition defined by the molar formula A_2BCO_6 wherein
A is selected from Pb ion alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is Pb ion,
B is Gd ion alone or in combination with one or more of other trivalent metal ions where at least about 90 mole % of B is Gd ion, and
C is selected from one or both of Nb and Ta ions.

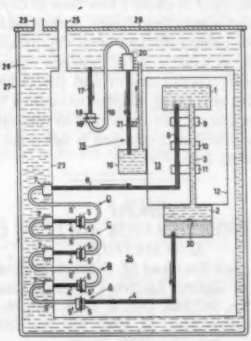
8. In cryogenic refrigeration apparatus comprising
a load to be refrigerated,
a refrigerant adapted to refrigerate the load at temperatures below 15° K.,
thermal energy absorbing elements associated with the refrigerant and adapted to function at temperatures below 15° K.,
wherein the improvement comprises at least one of the thermal energy absorbing elements being composed of sintered ceramic material:
(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with a composition defined by the molar formula A_2BCO_6 wherein
A is selected from Pb ion alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is Pb ion,
B is either Gd ion or Mn ion alone or in combination with one or more of other trivalent metal ions where at least about 90 mole % of B is Gd ion or Mn ion, and
C is selected from one or both of Nb and Ta ions.

4,296,609

^{3}HE-^{4}HE REFRIGERATOR

Adrianus P. Severijns, and Frans A. Staas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1980, Ser. No. 132,468
Claims priority, application Netherlands, Mar. 29, 1979, 7902438
Int. Cl.[3] **F25B** *19/00*
U.S. Cl. 62—514 R **3 Claims**



1. A ^{3}He-^{4}He refrigerator which comprises a mixing chamber for mixing liquid concentrated ^{3}He and superfluid ^{4}He; a segregating chamber accommodated at a lower level than the mixing chamber for separating a diluted ^{3}He phase and a concentrated ^{3}He phase; a connection duct between the mixing chamber and the upper part of the segregating chamber; and a thermomechanical pumping device based on the fountain pump effect for circulating superfluid ^{4}He including a first superleak communicating with the lower part of the segregat-

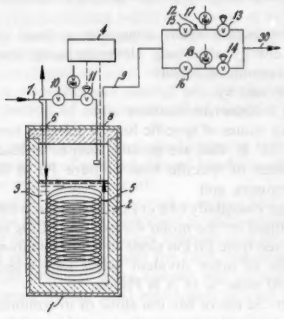
ing chamber for withdrawing superfluid ^4He from the segregating chamber and a second superleak opening into the mixing chamber for injecting superfluid ^4He into the mixing chamber, said thermomechanical pumping device being constituted by a plurality of series-arranged fountain pumps.

4,296,610

LIQUID CRYOGEN DELIVERY SYSTEM

Robert B. Davis, Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 17, 1980, Ser. No. 140,988
Int. Cl.³ F17C 7/02
U.S. Cl. 62—55 **7 Claims**



1. Apparatus capable of delivering small controlled quantities of a liquid cryogen to a use point in an intermittent manner comprising an on-period during which a predetermined amount of liquid cryogen is delivered to said use point continuously during said on-period, followed by an off-period during which no liquid cryogen is desired at said use point, said apparatus comprising in combination:

(a) insulated conduit means for transferring cryogen from a liquid cryogen supply source to said use point;

(b) subcooling means adjacent said use point and upstream thereof, adapted to condense vaporized cryogen in said conduit means and to subcool said cryogen; and

(c) flow control means located downstream of said subcooling means, adapted to cause a low flow of cryogen downstream of said subcooling means during said off-period, said low flow being sufficient upon vaporization to offset heat leaks in, as well as purge cryogen vapor from, said conduit means downstream of said subcooler, said flow control means also being adapted to cause a high flow of said cryogen during said on-period so that said predetermined amount of liquid cryogen is delivered to said use point essentially free of vapor.

4,296,611

HOUSEHOLD REFRIGERATOR AIR FLOW CONTROL AND METHOD

James R. Griffin, and Raymond M. Schreck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 967,743, Dec. 8, 1978, Pat. No. 4,229,945.
This application Mar. 24, 1980, Ser. No. 133,209
Int. Cl.³ F25D 17/06
U.S. Cl. 62—89 **7 Claims**

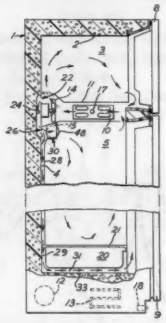
1. The method of controlling the temperature in a refrigerator having a freezer compartment and a fresh food compartment separated by a partition comprising:

(a) flowing a stream of cold air into the fresh food compartment,

(b) locating a temperature sensing element at the top of the fresh food compartment,

(c) shielding the temperature sensing element from the stream of cold air being directed into the fresh food compartment,

(d) controlling the temperature in both the freezer and fresh food compartments without significantly changing the constant ratio of those respective compartment temperatures by utilizing the temperature sensing element,



(e) dividing the stream of cold air entering the fresh food compartment into two streams, one going to the top of the fresh food compartment, and the other going to the bottom of the fresh food compartment, and

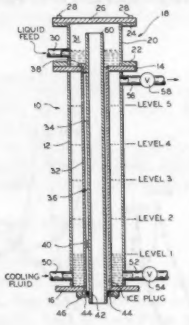
(f) controlling in equal ratio the amount of air flowing in the two streams to thereby change the ratio of the temperatures in the freezer and fresh food compartments.

4,296,612

FREEZE EXCHANGER WITH REMOVABLE TUBE LINER

Vincent F. Allo, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jun. 18, 1980, Ser. No. 160,667
Int. Cl.³ B01D 9/04
U.S. Cl. 62—123 **8 Claims**



1. A freeze exchanger comprising:

at least one freeze tube secured in, and penetrating, first and second spaced-apart tube sheets;

a cover beyond the first tube sheet;

a shell around the tube sheets and connected thereto, with said cover supported by the shell;

a removable tubular liner, in the freeze tube, of smaller outside diameter than the inside diameter of the freeze tube thereby defining an annulus between the two tubes;

means to deliver a liquid feed stream into a feed box space between the first tube sheet and the cover; and

means to deliver a cooling fluid around the freeze tube inside

of the shell between the first and second tube sheets and means to remove cooling fluid therefrom.

4,296,613

ABSORPTION REFRIGERATOR

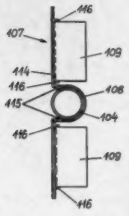
Nicholas Eber, CH-1830 Unterenqstringen, Switzerland

Filed Oct. 9, 1979, Ser. No. 82,929

Claims priority, application Switzerland, Oct. 18, 1978, 10763/78

Int. Cl.³ F25B *39/02*; F25F *1/30*

U.S. Cl. 62—515 **14 Claims**



1. An absorption refrigerator comprising

a heat-insulated box having a wall and a layer of insulation therein;

an absorption refrigeration unit having an evaporator tube for passage of a refrigerant therethrough; and

at least one finned body having a base plate mounted on said wall and defining a convexly curved section receiving said evaporator tube in heat-conductive relation and a plurality of vertically disposed cooling fins mounted on said plate in heat-conductive relation therewith and in spaced vertical relation to said curved section to define a gap, said curved section and said fins being directed towards the interior of said box.

4,296,614

LEATHER PRESS

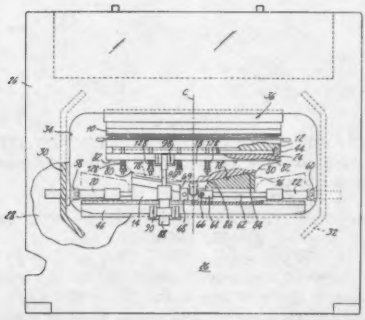
Robert K. Valks, Wetherby, England, assignor to USM Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 895,740, Apr. 13, 1978. This application Aug. 17, 1978, Ser. No. 934,602

Claims priority, application United Kingdom, Aug. 27, 1977, 36086/77

Int. Cl.³ C14B *1/30*

U.S. Cl. 69—48 **2 Claims**



1. A machine for effecting a pressing operation on an article, said machine comprising;

a first platen and a second platen mounted in a frame of said machine;

a first closing means for urging movement of the first and second platens relative to one another, said article being disposed therebetween;

a second closing means for applying final predetermined pressure on said article disposed between said first and second platens;

said second closing means comprising at least two pressurizable members arranged with one of said platens, each of said pressurizable members includes a pancake ram slidingly disposed in a pancake cylinder in a cylinder plate disposed on a support plate, said pancake rams occupying a substantial surface portion of said platen, with a periphery having a step-like configuration thereon; and

said pancake rams also have a sealing member arranged along its step-like periphery to ensure a sealing fit between said rams and said cylinders, said pancake rams being of elongated shape to permit said rams to extend generally into the corners of said platens.

4,296,615

ANTI-THEFT ARRANGEMENT, PARTICULARLY FOR A MAST OF A SAILING CRAFT

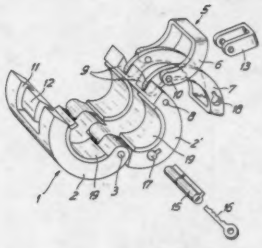
Reinhold Zoor, Dachau, Fed. Rep. of Germany, assignor to Heinrich Wunder KG, Dachau, Fed. Rep. of Germany

Filed Jul. 31, 1979, Ser. No. 62,295

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834338

Int. Cl.³ E05B *73/00*

U.S. Cl. 70—19 **16 Claims**



1. An arrangement for preventing unauthorized removal of a rod-shaped object, particularly a mast of a sailing or similar craft, from a support, comprising an annular attachment in the form of a sleeve consisting of a rigid material and configurated to substantially fittingly embrace a region of the object when in operative position; at least one screw meshing with and penetrating into the interior of said sleeve for clampingly engaging said region of the object; means for locking said screw, at least in said operative position of said attachment; and means for confining said attachment to a particular area of the support.

4,296,616

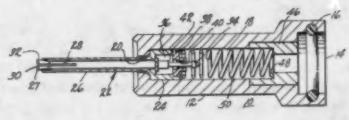
ADAPTOR FOR PLUNGER LOCK OPERATING TOOL

Richard S. Guiler, Stewartsville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Sep. 14, 1979, Ser. No. 75,849

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **6 Claims**



1. An adaptor tool for temporary assembly onto a plunger lock unlocking tool of a type having forwardly projecting

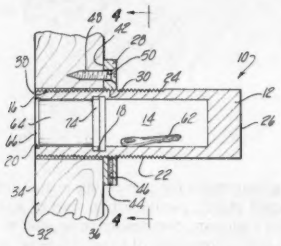
members which operate to grasp the external surface of the unlocking pin of a plunger lock and pull the pin to the unlocking position, said adaptor tool enabling the unlocking tool to be used to unlock a plunger lock of the type in which the unlocking member is a hollow tube, and comprising a hollow housing having means at the rear end for engaging the front end of the unlocking tool so that the forwardly projecting members extend into the housing, operating means in said housing having a portion positioned for engagement by said members when the tool is operated, said means being spring biased toward the front end of the housing and being movable toward the rear end by the operation of said tool, expandable mechanism projecting from the forward end of the housing for insertion into the hollow unlocking pin of a plunger lock, and means responsive to the movement of said means toward the rear of the housing to cause the expansion of said expandable mechanism and retraction thereof toward the housing.

4,296,617

LOCKABLE KEY HOLDING RECEPTACLE

Barry A. Campagna, Oak Park, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 10, 1979, Ser. No. 101,455
Int. Cl.³ E05B *65/52*
U.S. Cl. 70—63 **8 Claims**



1. A receptacle for a key, said receptacle being attachable to a door or like structure having an interior surface and an exterior surface, said receptacle comprising:

an elongated housing having a length greater than the width of said door, said housing having a longitudinally extending cavity which is open through only one axial end of the housing, said housing being positioned through an aperture in said door so that the open end of said housing faces outwardly flush from the exterior surface of said door so that a portion of the housing protrudes radially inwardly from the interior surface of the door;

means for attaching said housing to the interior surface of said door;

a closure plug receivable within the open axial end of said housing; and

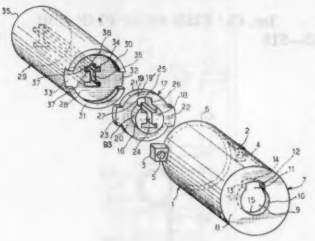
means for removably locking said plug to said housing wherein said cavity is circular in cross-sectional shape and has a circumferentially extending groove formed about its inner periphery at a position spaced from said open end of the housing, and wherein said means for locking said plug to said housing comprises a lock cylinder having a detent a portion of which enters said groove upon rotation of said lock cylinder.

4,296,618

LOCK AND KEY DEVICE

Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed Dec. 29, 1978, Ser. No. 974,557
Claims priority, application France, Dec. 30, 1977, 77 39747
Int. Cl.³ E05B *19/02, 29/02*
U.S. Cl. 70—358 **3 Claims**



1. A lock and key device, with the key comprising two pairs of slotted wings and the lock comprising a fixed hollow shaft with a rear traverse wall having a notching for the passage of the key, inside the fixed hollow shaft a rotary barrel with a rear partition provided with a conjugate slot of the key profile and interposed between the rotary barrel and the fixed hollow shaft coupling means which can only be rotated when the key has reached a driven-in position which is predetermined by a stop, a housing in back of the rear partition of the rotary barrel provided by extensions thereon, a cylindrical ring complementary to said housing extensions through external ears, a passage in said cylindrical ring of the key profile and having an internal slot with the same width as the wings; said key having, in addition to the slotted wings, on a connecting portion between the wings of one pair and a body of the key a projecting part with the same conjugate shape as said internal slot of the cylindrical ring so that when the key, after being driven into place, is under load stress to make a rotative motion, it will rotate the assembly made up of the ring and the rotary barrel through cooperation of one lateral face of its projecting part with a face opposite the slot, and the other face of the projecting part cooperating, through sliding during the rotative motion, with the front face of said rear traverse wall of the fixed hollow shaft so as to prevent the key from being withdrawn as long as it has not made a complete turn.

4,296,619

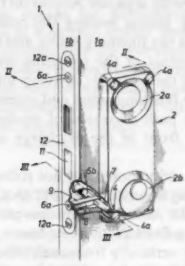
ANCHORING MEANS FOR DOOR LOCK PLATES

Bo G. Widen, Torshälla, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden

Filed Dec. 20, 1979, Ser. No. 105,490
Claims priority, application Sweden, Dec. 29, 1978, 7813472
Int. Cl.³ E05B *9/08*
U.S. Cl. 70—451 **9 Claims**

1. An anchoring arrangement for a door plate of a lock, said plate being secured to a door or the like by means of at least one upper and one lower securing means, said door accommodating a lock housing secured in a recess formed in a side edge of the door adjacent said plate and covered by a lock pillar, said securing means each cooperating with an anchoring element inserted from the pillar side of the door, said securing means including a rotatable part which is locked against rota-

tion by the anchoring element inserted from the lock-pillar side of the door, each of said anchoring elements comprising a



screw, and wherein said screws also secure the lock pillar to the side edge of the door.

4,296,620

SMOOTHING ROLLING MILL

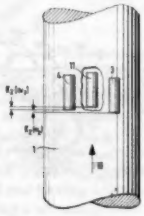
Siegfried Bagusche, Loevenich, Fed. Rep. of Germany, assignor to W. Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 77,995

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2844974

Int. Cl.³ B21D *19/00*

U.S. Cl. 72—100 **8 Claims**



1. A smoothing rolling mill apparatus for smoothing roller action on a work piece mounted for rotation about a longitudinal central axis of the work piece, comprising a plurality of smoothing roller means, support means operatively supporting said roller means relative to said work piece, said roller means being distributed unevenly around the longitudinal central axis of said work piece, said support means holding said roller means in spaced positions such that a relative axial offset or displacement Kz is established between the facing ends of said roller means, and wherein said relative axial displacement Kz satisfies at least approximately the following equation:

$$Kz = s\left(1 - \frac{\alpha z \cdot n}{360}\right)$$

wherein s is the feed advance produced by each roller means for each rotation of the work piece, n is the number of roller means distributed about the work piece, and wherein

αz is the angle enclosed by the two lines extending radially through said longitudinal central axis of said work piece and radially through the rotational axis of the respective roller means of two neighboring roller means whereby the full feed advance capacity of each said roller means is cumulatively effective.

4,296,621

MACHINES FOR FORMING COILED SPRINGS

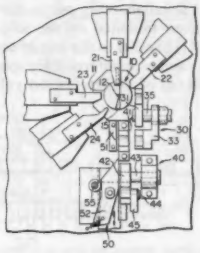
Yozo Ohdai, and Yasuyuki Takahata, both of Kasugai, Japan, assignors to Asahi-Seiki Manufacturing Co., Ltd., Owariasahi, Japan

Filed Dec. 4, 1979, Ser. No. 100,246

Claims priority, application Japan, Feb. 28, 1979, 54/23921

Int. Cl.³ B21F *35/02, 11/00, 3/027*

U.S. Cl. 72—130 **9 Claims**



1. A machine for forming coil springs of the type having a coiled body portion and first and second end loops at opposed ends of said body portion comprising:

a wire guide member having a void in one side thereof for receiving a coiled body portion and a wire guide groove therethrough, said wire guide groove permitting a wire to be fed therethrough;

a first tool member having a tapered free end, said first tool members being mounted for movement from a retracted position to an advanced position in which said tapered free end is effective to contact said wire fed through said guide groove for bending and coiling thereof at a first position adjacent an outlet orifice of said guide groove;

a second tool member;

a complementary tool member;

said second and complementary tool members being mounted for movement into gripping abutment with said wire at said first position;

a third tool member for contacting and bending said wire through a large angle while it is gripped at said first position by said second and complementary tool members at a first end of said body adjacent said first position where said wire is gripped;

first holding means operative to grip said body at a first portion thereof;

second holding means operative to grip said body at a second portion thereof; and

bending means for forming a large angle bend at a second end of said body adjacent a second position where said body is gripped by one of said first and second holding means.

4,296,622

DEVICE FOR INSERTING AND THRUSTING A BAR INTO A PRESS PIERCING MILL

Aurindo Nessi, Albate (Como), Italy, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Apr. 11, 1979, Ser. No. 29,072

Claims priority, application Italy, Apr. 21, 1978, 22600 A/78

Int. Cl.³ B21B *17/00, 19/04*

U.S. Cl. 72—208 **6 Claims**

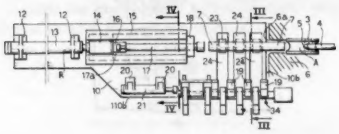
1. A device for inserting and thrusting a bar into a press piercing mill including a rolling machine having a pair of rolls, a piercing bit mounted along the rolling axis (A) of the machine and on the outlet side thereof, an inlet guide for the rolling machine and a bedplate holding the bar and extending along the rolling axis (A) from the inlet side of the guide, such device comprising:

a motor driven shaft rotatably borne by the inlet guide and having its axis of rotation parallel to the rolling axis (A);

a substantially drum-shaped bedplate coaxially keyed to the said motor-driven shaft;

a first thrust means mounted on the said drum-shaped bedplate and acting in a line (R) parallel to the axis of rotation of the said motor-driven shaft and separated therefrom by a distance equal to the distance between the axis of rotation and the rolling axis (A), the first thrust means being adapted to subject a bar to a thrust having a given value in order to roll and simultaneously pierce the bar;

a second thrust means mounted on the said bedplate and acting in a line (R_1) parallel to the line of action (R) of the first thrust means and circumferentially spaced therefrom by a center angle (α) of predetermined value, the line of



action (R_1) being also at a distance from the axis of rotation of the said motor-driven shaft equal to the distance between the axis of rotation and the rolling axis (A), the second thrust means being adapted to subject said bar to a thrust for inserting it into the rolling machine through the inlet guide thereof; and

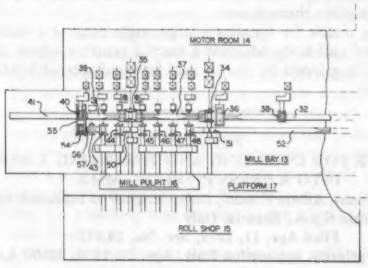
a motor for angularly moving the motor-driven shaft around its axis of rotation from a position in which the line of action (R) of the said first thrust means coincides with the rolling axis (A) and the line of action (R_1) of the said second thrust means is at an angular distance from the rolling axis (A) to a second position in which the line of action (R_1) of the said second thrust means coincides with the rolling axis (A) and the line of action (R) of the first thrust means is at an angular distance therefrom.

4,296,623

SEMI-CONTINUOUS HOT ROLLING OF METAL STRIP AND PLATES

Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed Sep. 12, 1979, Ser. No. 74,876
Int. Cl.³ B21B *1/34*; B21C *47/00*
U.S. Cl. 72—227 **30 Claims**



1. Apparatus for hot rolling metal workpieces into strip or plate without reheating comprising a mill table, a heating furnace adjacent the mill table positioned to discharge heated workpieces thereon, a roughing stand following the mill table, collecting means at the other end of the roughing stand from the mill table for accumulating the rolled product of the roughing stand, a finishing stand spaced both laterally and longitudinally from the roughing stand, delivery means preceding the entry end of the finishing stand laterally adjacent the collecting means, but at a different elevation therefrom, whereby both stands can be driven by separate motors on the same side of the stand, the delivery means feeding the rolled product of the roughing stand into the finishing stand, and means for transferring the rolled product of the roughing stand while it is hot from the collecting means to the delivery means, and a run out table following the finishing stand and extending in a direction different from the path of travel of workpieces leaving the delivery means in front of the discharge end of the heating furnace.

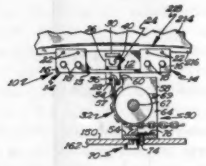
19. An upcoiler and uncoiler for hot rolled strip comprising a cylindrical housing in scroll form split on a vertical plane into a larger and a smaller element, means pivoting each element of the housing about a fixed pivot at its lower edge, those lower edges being spaced vertically from each other so as to form the upper and lower edges of an entry into the housing at the bottom thereof, an entry guide leading into the entry, and parallel driven coil-supporting rolls at the same elevation straddling the vertical plane and forming a continuation of the lower end of the smaller element.

4,296,624

ACCESSORY FOR AN APPARATUS FOR REPAIRING AND STRAIGHTENING

Gerald A. Specktor, 409 Cleveland Ave. South, St. Paul, Minn. 55105

Division of Ser. No. 722,825, Sep. 13, 1976, Pat. No. 4,138,877, which is a continuation of Ser. No. 550,378, Feb. 18, 1975, abandoned. This application Jan. 5, 1979, Ser. No. 1,082
Int. Cl.³ B21D *1/12, 1/14*
U.S. Cl. 72—308 **10 Claims**



1. Accessory for an apparatus for repairing and straightening including a support surface for supporting a vehicle thereon comprising, in combination: a flexible pulling member including means at one end for attaching to the vehicle; down pull means for directing the flexible pulling member at an angle to the vehicle including substantially vertically of the vehicle; and means, for rotation about a vertical axis, for attaching the down pull means to the support surface vertically below the vehicle, for allowing rotational self-alignment of the down pull means about the vertical axis, and for allowing the down pull means to be substantially in line with the flexible pulling member when a repair force is applied to the other end of the flexible pulling member, wherein the down pull means comprises: a pulley, and means for removably, rotatably mounting the pulley, wherein the removably, rotatably mounting means comprises, in combination: a pin, and a first arm and a second arm upstanding from a center section, with the first and second arms having apertures formed therein for removably receiving the pin, and wherein the support surface has a top surface and a bottom surface defining a finite thickness and further includes at least one regularly shaped aperture passing vertically through the support surface and wherein the attaching, self-alignment, and allowing means comprises, in combination: attachment means having a cross sectional size substantially equal to but slightly less than the size of the aperture and having a removed portion of a thickness substantially equal to but slightly greater than the thickness of the support surface for allowing the attachment means to be vertically inserted

into the support surface aperture and moved in a first lateral direction parallel to the support surface to engage the support surface within the removed portion, with a lip being defined by the removed portion for abutting with the bottom surface of the support surface; means for preventing the attachment means from moving in a second lateral direction opposite to the first lateral direction and for preventing unintentional removal of the attachment means from the aperture; and means extending around the preventing means, located on the opposite side of the attachment means from the lip, for abutting with the top surface of the support surface.

4,296,625

CRANK PRESS WITH LATERAL ROD EJECTOR

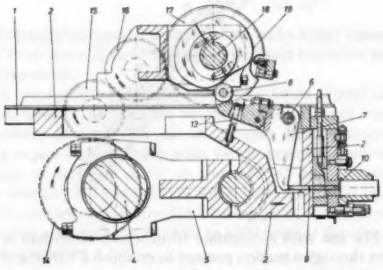
Alois Weller, Erkrath, and Wolfgang Mai, Kaarst, both of Fed. Rep. of Germany, assignors to Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,235

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827561

Int. Cl.³ B21D *45/00*

U.S. Cl. 72—345 **3 Claims**



1. In an improved crank press arrangement having a frame, a lateral ejector rod, and reciprocating sled movably mounted on said frame which is driven by a crank drive, wherein the ejector rod is slidably mounted in the sled and a positioning bush and coacts with a die, a toggle lever being pivotably mounted on said sled and having a first arm coacting with said ejector rod, and having a second arm on which a cam-follower roller is rotatably mounted, a control cam rotatably mounted and being in operative contact with said cam-follower roller, the improvement comprising that the contour and shape of the control cam, rotatably mounted in said frame, is such that while the cam-follower roller is in continuous contact therewith, nevertheless a temporary standstill of the ejector rod occurs relative to the frame during the operative cycles of the arrangement.

4,296,626

WHEEL ALIGNMENT APPARATUS

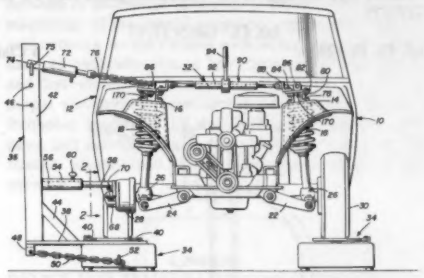
Davis R. Jarman, 610 Ward Dr., and Virgil H. Hinson, 206 Fairway Oaks, both of Brunswick, Ga. 31520

Filed Jun. 21, 1979, Ser. No. 50,528

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—392 **11 Claims**

1. An alignment apparatus for a motor vehicle front end system including body sheet metal supported upper suspension strut end anchor locations, a pair of adaptor assemblies, said adaptor assemblies including mounting means for removable anchoring to said anchor locations, an elongated adjustable length thrust member of the push and pull type, means pivotally attaching the opposite end portions of said thrust member to said adaptor assemblies, a stand anchorable to the supporting surface for said vehicle on one side of the latter, an elongated pull structure having one end anchored to an upper portion of said stand and the other end thereof anchored to the adjacent adaptor assembly of said vehicle, an intermediate portion of said stand including a horizontally outwardly projecting adjustable length arm supported therefrom, the outer end of said arm including abutment structure for abutting and securement to an adjacent wheel hub of the associated vehicle, said stand being generally L-shaped in configuration including



a lower horizontal leg and an upper vertical leg whose lower end is anchored to one end of the lower leg and from an intermediate height portion of which said adjustable length arm is supported, the outer end of said lower horizontal leg including a turntable supported therefrom upon which a wheel supported from said wheel hub may rest.

4,296,627

METHOD AND DEVICE FOR MEASURING THE REQUIRED COOLING CAPACITY OF A COLD SPACE AND THE REFRIGERATION CAPACITY OF THE REFRIGERATING MACHINERY

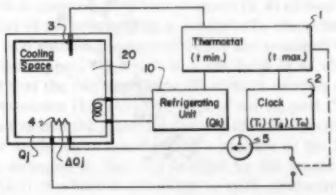
Yrjö V. Lindström, Helsinki, Finland, assignor to Alnor Oy, Finland

Filed Dec. 28, 1979, Ser. No. 107,767

Claims priority, application Finland, Jan. 4, 1979, 790022

Int. Cl.³ G01K *17/00*

U.S. Cl. 73—15 R **5 Claims**



1. A method of determining the cooling capacity of a container comprising, cooling contents of the container to a first low temperature below an ambient temperature, permitting the contents of the container to rise to a second higher temperature below the ambient temperature during a first period, measuring the length of the first period, cooling the contents of the space again to the first low temperature during a second period, permitting the temperature to rise to the second higher temperature during a third period, heating the contents of the container during the third period by a known amount, and measuring the length of the third period to determine the thermal capacity of the container using the known amount of heating and the measured first and third periods.

4,296,628

SYSTEM FOR DETECTING PARTICLES CARRIED BY A FLUID FLOW

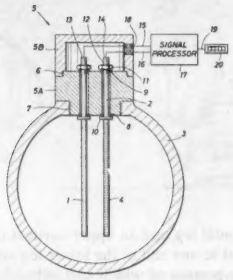
Harm Mast, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 5, 1980, Ser. No. 156,847

Claims priority, application United Kingdom, Jun. 26, 1979, 22277/79

Int. Cl.³ G01N *15/07*

U.S. Cl. 73—28 6 Claims



1. A system for detecting particles carried by a fluid flow, said system including:

at least two metal bodies each cooperating with an acoustical transducer means adapted to detect acoustic energy in the relevant body and to generate electric signals representative of such energy, one of the bodies having at least part of the metal surface thereof covered with a layer of acoustic dampening material; and,

means for substracting one of the electric signals from the other signal and recording the resulting signal.

4,296,629

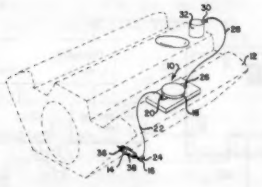
PISTON TOP-DEAD-CENTER DETECTOR

John M. Vuyovich, 1369 McDuff St., Los Angeles, Calif. 90026

Filed Dec. 17, 1979, Ser. No. 104,374

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 8 Claims



1. A piston top-dead-center detector comprising the combination of:

an adapter assembly for making electrical contact with a piston in an internal combustion engine when the piston is in a top-dead-center position, the piston being at a given electrical potential and the adapter assembly comprising a first member adapted to be seated within a sparkplug hole in an internal combustion engine and a second member of electrically conductive material extending through and electrically insulated from the first member, the second member being capable of sliding within the first member and at the same time having a sufficiently snug fit within the first member so as to avoid sliding movement relative to the first member in the absence of the application of a substantial force to the second member;

an electrical terminal having a different potential from the given electrical potential; and

a lamp coupled between the adapter assembly and the electrical terminal.

4,296,630

APPARATUS FOR CAPACITIVE FILLING-LEVEL MEASURING, PARTICULARLY IN A MOTOR VEHICLE TANK

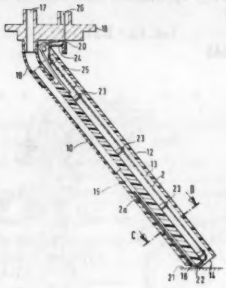
Wilhelm Jung, Giessen-Kleinlinden, and Karl Rau, Mühlheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,116

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908449

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C 11 Claims



1. For use with a container from which a medium is withdrawn through a suction passage to establish a variable level of the mdium above a bottom of the container,

and apparatus for measuring said level of the medium within the container having insulated electrodes immersed in said medium to form measuring and compensation capacitors, the capacitances of which are dependent on the dielectric constant of the medium, the improvement comprising insulating means within which said electrodes are disposed in non-conductive relation to the medium and having separate sections within which the electrodes respectively form the measuring and compensation capacitors, and support mans mounting only one of the separate sections of the insulating means in constant operative relation to the medium within said suction passage and the other of the sections externally of the suction passage within the container.

4,296,631

LIQUID CRYSTAL COMPOSITIONS AND DEVICES

James L. Fergason, Kent, Ohio, assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Sep. 21, 1979, Ser. No. 77,612

Int. Cl.³ C09K *3/34;* C01K *3/00, 11/16*

U.S. Cl. 73—356 32 Claims

14. A process for inhibiting the growth of domains in the isotropic liquid state of a cholesteric-to-liquid crystal composition, which comprises; adjusting the viscosity of said liquid state composition to about 20 to 6500 poise while retaining the twisting power of the cholesteric liquid crystal composition to selectively scatter visible light below the cholesteric-to-liquid transition point.

16. An improved temperature recording device, which comprises;

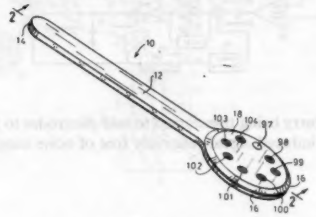
an opaque support member;

a cholesteric liquid crystal composition disposed on said support member, said composition comprising a mixture of

(a) an optically active liquid crystal compound characterized in part by an intrinsic left-handed helical structure and a liquid viscosity of between about 25 poise and 6500 poise; and

(b) a liquid crystal compound selected from those having an intrinsic right-handed helical structure, nematic liquid crystals and mixtures thereof;

the proportions of (a) and (b) being such as to provide said composition with a cholesteric-to-liquid transition point, a twisting power such that the resulting composition will selectively scatter visible light below said liquid transition point, and will cease to scatter visible light above said



cholesteric-to-liquid transition point; and a liquid viscosity of from about 20 to 6500 poise at the liquid transition point temperature.

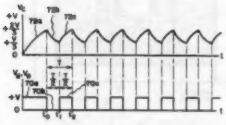
31. A temperature indicating cholesteric liquid crystal composition, which comprises; an optionally active liquid crystal composition characterized by an intrinsic helical structure such as to provide a clearing point for the composition within the range of from about 10° to about 70° C. and a twisting power whereby the composition will selectively scatter visible light at a temperature below the clearing point, said composition having a viscosity of from 20 to 6500 poise at the clearing point temperature.

4,296,632

TEMPERATURE-TO-FREQUENCY CONVERSION APPARATUS

Milton D. Bloomer, and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,489
Int. Cl.³ G01K 7/16
U.S. Cl. 73—362 AR **27 Claims**



1. In apparatus for converting the magnitude of a sensed parameter to the frequency of an output waveform, of the type having means providing an output waveform cyclically alternating, relative to a preselected potential of fixed magnitude, between first and second output voltage levels, responsive to a voltage at a single input respectively less than or equal to a first reference potential and greater than or equal to a second reference potential, the improvement comprising:

a timing capacitance element connected between the single input and the preselected potential; and

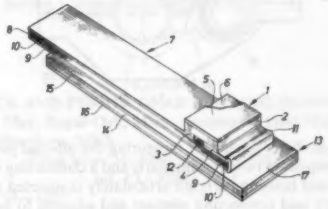
network means connected between said output and said single input for providing an electrical conductance therebetween of magnitude substantially linearly related to the magnitude of the sensed parameter; the conductance of said network means causing said timing capacitance element to cyclically charge and discharge to said second and first reference potentials respectively to provide said output waveform substantially as a squarewave having a frequency established by said preselected timing capacitance and network conductance values and substantially linearly proportional to the conductance value of said network means.

4,296,633

DEVICE FOR TEMPERATURE MEASUREMENT

Hakan B. Hakansson; Lennart P. E. Persson, both of Lund, and Berth-Ove G. Wall, Bjärred, all of Sweden, assignors to Gambro AB, Sweden

PCT No. PCT/SE78/00012, § 371 Date Mar. 3, 1980, § 102(e) Date Jun. 1, 1979, PCT Pub. No. WO80/00191, PCT Pub. Date Feb. 7, 1980
PCT Filed Jul. 3, 1978, Ser. No. 131,079
Int. Cl.³ G01K 7/22
U.S. Cl. 73—362 AR **21 Claims**



1. A device for temperature measurement comprising a temperature-sensitive sensor (1), whose electrical properties, e.g. the resistance, vary with the temperature, e.g. a thermistor, and which is connected via two contacts (3, 4) to two electric conductors (9,10) arranged on a support (7), characterized in that the two electric conductors (9,10) are arranged on both sides of the support (7) which is in the form of an elongated strip and that the one conductor (9) extends directly or via a suitable extension (11) over one edge of the support (7) in the direction towards the other conductor (10) but without reaching as far as the same thus forming a gap, slit or the like (12) which is arranged so that it is bridged by the sensor (1) one contact (3,4) of which is connected to each conductor (9,10).

4,296,634

SEPTUM FOR USE IN GAS CHROMATOGRAPHY AND METHOD OF OPERATION

Robert H. Goodale, 7355 Yucca Ct., Boulder, Colo. 80301, and George M. DuJack, Jr., 391 Fourth St., Troy, N.Y. 12180

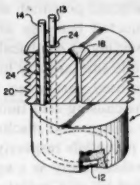
Filed Feb. 20, 1980, Ser. No. 122,916
Int. Cl.³ G01N 37/00
U.S. Cl. 73—864.86 **16 Claims**

1. A septum for use in gas chromatographic apparatus, the septum comprising,

a septum member of an elastomeric material, and

cooling means positioned internally of the septum member,

whereby the temperature of the septum may be maintained at a lowered level when exposed to column gases at



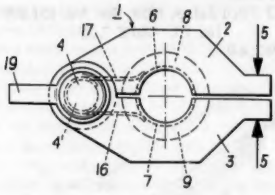
elevated temperatures while avoiding substantial cooling of such gases by the septum.

4,296,635

TRANSDUCER DEVICE FOR MEASURING THE INTERNAL PRESSURE IN PIPES

Peter Claassen; Helmut List, and Rudolf Zeiringer, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jun. 11, 1980, Ser. No. 158,515
Int. Cl.³ G01L *7/02*
U.S. Cl. 73—730 **10 Claims**



1. A transducer device for measuring the internal pressure in pipes, comprising two housing parts and a connecting element, wherein said housing parts are articulately connected with one another by said connecting element and adapted to be fixedly mounted on the pipe by means of a clamping device, each of said housing parts contains at least one measuring element with a bipolar take-off of test signals, at least one pole of each take-off is electrically conductingly connected with a part of said connecting element which is electrically insulated relative to the other pole, and the connecting element comprises connection terminals for the further conduction or transmission of the test signals, the said other pole being potentially in direct connection with the pipe.

4,296,636

NOISE-REDUCING ELECTRODES FOR ELECTROMAGNETIC FLOWMETER

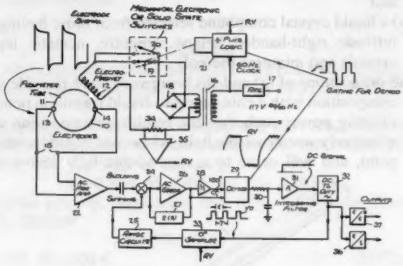
Elmer D. Mannherz, Bucks County, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed May 22, 1980, Ser. No. 152,479
Int. Cl.³ G01F *1/58*
U.S. Cl. 73—861.12 **6 Claims**

1. An electromagnetic flowmeter for measuring the flow rate of a slurry containing solid particles, said flowmeter comprising:

A. a flow tube having a pair of electrodes mounted thereon at diametrically-opposed positions, said electrodes having a surface with a metallurgical hardness of at least Rockwell A85, whereby the impingement of said solid particles thereon does not result in the substantial generation of noise components; and

B. an electromagnet having a coil which is excited by a low frequency wave derived from a standard a-c power line, the frequency of the wave being low relative to that of the line to produce a transverse magnetic field within the tube which is intersected by the slurry, the voltage induced in



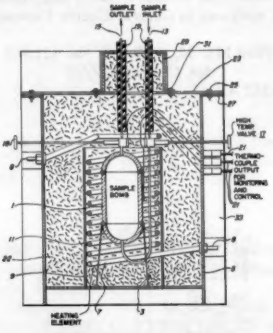
the slurry being transferred to said electrodes to provide a flow-induced signal relatively free of noise components.

4,296,637

METHOD AND APPARATUS FOR SAMPLING HOT HOMOGENEOUS MIXTURES

Narasimhan Calamur, and Morris R. Schoenberg, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 28, 1980, Ser. No. 134,879
Int. Cl.³ G01N *1/22*; H05B *3/06*
U.S. Cl. 73—863.11 **9 Claims**



7. A method for sampling hot homogeneous mixtures which form multiple phases at a temperature above ambient temperature which comprises:

(a) heating a sample vessel and attached inlet and outlet means and valve means to a temperature above the dew point of said homogeneous mixture;

(b) purging said sample vessel and said inlet and outlet means and valve means with an inert gas;

(c) collecting a portion of said hot homogeneous mixture in said sample vessel;

(d) sealing said sample vessel with said valve means; and

(e) maintaining the temperature of said mixture above the dew point of said mixture.

4,296,638

SAMPLING MOLTEN METAL

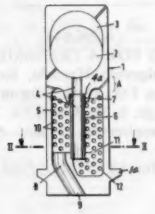
Gustav Kolb, Im Ohl 52, 5870 Hemer, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf and Gustav Kolb, Hemer, both of, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 92,849

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849333

Int. Cl.³ G01N *1/12*

U.S. Cl. 73—863.21 6 Claims



1. Apparatus for sampling molten metal, e.g., steel, and including a body which contains a plurality of chambers, comprising:

an upper, mold-defining chamber in the body for a sample;

a lower slag retention chamber disposed underneath the mold-defining chamber;

a duct in the body, ending upwardly in a bottom of the mold-defining chamber;

an upright refractory tube, communicating with the duct at its lower end and traversing the slag retention chamber, the tube having a lower end disposed in a lower portion of the slag retention chamber, the tube being held by the body at least at an upper portion of the slag retention chamber;

an eccentrically disposed, flow-reversing chamber as part of the slag retention chamber and extending under, and at a lower level of, the lower end of the tube; and

a feed duct leading from an outside surface to the slag retention chamber.

4,296,639

FREE ROTOR GYRO WITH THREE TORQUERS AND THREE PICKOFFS

Menno G. Koning, Dover, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jan. 16, 1980, Ser. No. 112,870

Int. Cl.³ G01C *19/28, 19/30*

U.S. Cl. 74—5.46 12 Claims

1. In a free gyro having a case, a rotor having an inertial mass distributed about a spin axis, means in said case for imparting constant rotation to said rotor, and means for freely suspending said rotor within said case to make the orientation of the spin axis independent of the orientation of said case over a given range with respect to a nominal reference orientation of said spin axis fixed relative to said case, the improvement comprising

torquer means for applying discretely variable forces to said rotor at three coplanar locations fixed with respect to said case and equally spaced circumferentially about the spin axis in said nominal orientation.

4,296,640

POWER TRANSMISSION V-BELT AND METHOD OF MANUFACTURE

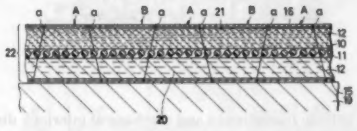
Soukichi Nosaka, Kobe, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed May 31, 1979, Ser. No. 44,289

Claims priority, application Japan, Dec. 16, 1978, 53-156030

Int. Cl.³ F16G *5/16, 5/00*

U.S. Cl. 474—262 16 Claims



1. A power transmission V-belt comprising: a tensile number (11) arranged in the form of a layer along the center line of said belt; elastic rubber layers (13, 14) formed respectively on opposite surfaces of the layer of said tensile member; fabric layers (15, 16) bonded to the outside surfaces of said elastic rubber layers respectively, said fabric layers having different amounts of stretchability in the longitudinal direction of said belt, and said belt having a trapezoid cross-section.

4,296,641

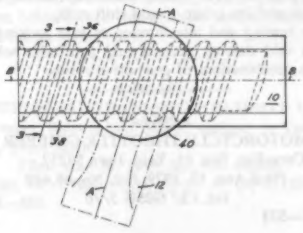
RACK AND PINION GEAR BEARING SUPPORT

James I. May, Royal Oak, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1980, Ser. No. 135,601

Int. Cl.³ F16H *1/04*

U.S. Cl. 74—422 5 Claims



1. A rack and pinion gear mechanism comprising:

a driving pinion;

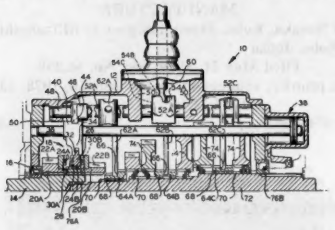
a rack in meshing engagement with and driven by said pinion having at least two bearing surfaces whose center of curvature is located at the midpoint of a radial plane disposed perpendicular to the rack axis and passing through the center of a pinion tooth, the plane extending radially between the projection onto the plane of the radial extremities between which the contact point between a pinion tooth and a rack tooth moves on the face of the pinion tooth; and

a saddle bearing for supporting said rack having bearing surfaces disposed on opposite sides of the plane, mating with and complementary to the bearing surfaces of said rack.

4,296,642
TRANSMISSION INTERLOCK

Thomas C. Schetter, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 20, 1979, Ser. No. 67,932
Int. Cl.[3] B60K *20/00*; F16H *57/06*; G05G *5/10*; F16H *3/02*
U.S. Cl. 74—475 13 Claims

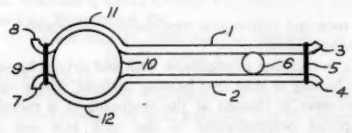


8. A vehicle transmission and mechanical interlock disposed within a unitary housing comprising, in combination,
an input shaft,
an output shaft,
a first gear ratio selection means for effecting at least two distinct gear drive ratios between said input shaft and said output shaft,
at least one axially translatable first shift rail associated with said first gear selection means,
a second gear ratio selection means in tandem with said first gear ratio selection means for effecting at least two distinct gear drive ratios between said input shaft and said output shaft,
at least one axially translatable second shift rail associated with said second gear selection means,
an axially translatable auxiliary rail disposed generally between and parallel to said first and second shift rail,
a linkage means between said auxiliary rail and one of said first and second shift rails for positively axially translating said auxiliary rail with said one of said rails,
a locking member positioned transversely between said auxiliary rail and the other of said first and second shift rails, a plurality of re-entrant detents defined by said auxiliary rail and the other of said shift rails,
whereby seating and interference of said locking member within said detents permits and precludes selection of certain combinations of gear drive ratios.

4,296,643
MOTORCYCLE THROTTLE GRIPPER

Morris E. Cornelius, Box 91, Yale, Iowa 50277

Filed Aug. 13, 1979, Ser. No. 66,429
Int. Cl.[3] G05G *5/16*
U.S. Cl. 74—531 3 Claims

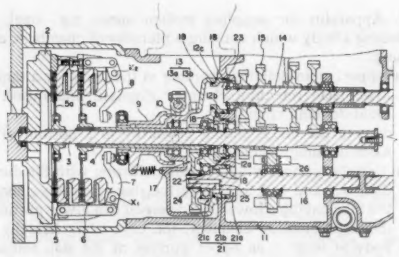


1. A motorcycle throttle gripper comprising: an upper friction lever and a lower friction lever with one said friction lever positioned above the throttle grip hand control and brake lever hand control and with one said friction lever positioned below the throttle grip hand control and brake lever hand control, and with an offset concave portion on each said friction lever to provide efficient rotational frictional contact with the throttle grip hand control, and with a straight portion on each said friction lever to provide efficient sliding friction contact with the brake lever hand control, and with the right hand extremities of the two said friction levers bent or hooked slightly to accept a flexing elastic member to keep the two said friction levers in efficient sliding contact with the brake lever hand control, and with the left hand extremities of the two said friction levers bent or hooked slightly to accept a flexing elastic member to keep the two said friction levers in efficient rotational frictional contact with the throttle grip hand control, with the two said efficient friction levers providing near zero backlash throttle gripping control.

4,296,644
CASING FOR A TRANSMISSION

Kenzo Sada, and Shigeyuki Hayashi, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 5, 1979, Ser. No. 27,341
Claims priority, application Japan, Aug. 10, 1978, 53-110967[U]
Int. Cl.[3] F16H *57/02*
U.S. Cl. 74—606 R 10 Claims



7. A casing for a transmission comprising:
a first transmission case having a running system transmission shaft, a running system input shaft mounted below the transmission shaft, and a PTO transmission shaft mounted below the input shaft;
a second transmission case connected to a forward portion of the first transmission case, said input shaft extending forwardly through the second transmission case and operatively connected to a running system clutch, said PTO transmission shaft having a forward end thereof located in the second transmission case;
a tubular PTO input shaft relatively rotatably fitted on said running system input shaft and operatively connected at a forward end thereof to a PTO system clutch, a rearward end of said PTO input shaft being located in the second transmission case;
a gear coupling mechanism mounted in the second transmission case to operatively connect said PTO input shaft and said PTO transmission shaft;
a lower tubular member fitted between the first transmission case and the second transmission case at a position where the PTO transmission shaft extends through the cases, the PTO transmission shaft extending through said lower tubular member;
an oil channel between the lower tubular member and the PTO transmission shaft to provide communication between the first and second transmission cases;
an upper tubular member fitted between the first transmission case and the second transmission case at a position where the running system transmission shaft is supported, said upper tubular member defining an air channel to communicate between the first and second transmission cases; and
oil seals respectively interposed between an outer periphery

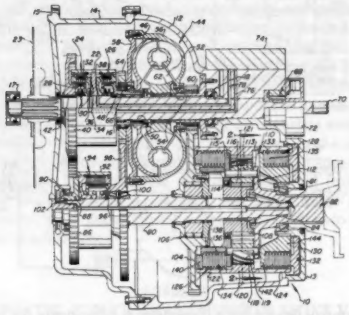
of the lower tubular member and the first and second transmission cases and between an outer periphery of the upper tubular member and the first and second transmission cases whereby the first and second transmission cases are interconnected in oiltight condition.

4,296,645

POWERSHIFT TRANSMISSION WITH DIRECT DRIVE AND MODULATED TORQUE CONVERTER DRIVE IN FORWARD AND REVERSE

James J. Jameson, Coffeyville, Kans., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 14, 1979, Ser. No. 75,465
Int. Cl.³ F16H *47/08, 57/00*
U.S. Cl. 74—688 **19 Claims**



1. A multispeed gear transmission comprising:
a housing;
an input shaft rotatably mounted in said housing;
a hydrokinetic torque converter disposed in said housing including an impeller and a turbine;
first and second gears drivenly connected to said turbine;
a countershaft rotatably mounted in said housing and disposed in generally parallel relation to said input shaft;
third and fourth gears mounted on said countershaft and intermeshed respectively with said first and second gears;
clutch means drivingly interconnecting said third gear to said countershaft;
a first fluid actuated clutch drivingly connecting said input shaft to said impeller;
an output shaft; and,
a reversing mechanism interconnecting said countershaft and said output shaft for reversing the direction of rotation of said output shaft with respect to said countershaft.

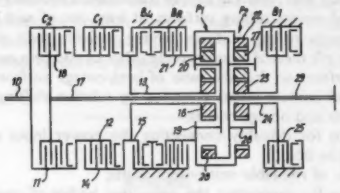
4,296,646

AUTOMATIC TRANSMISSION

Kenneth Thornton, Nantwich, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Dec. 6, 1978, Ser. No. 967,150
Claims priority, application United Kingdom, Jan. 5, 1978, 00284/78
Int. Cl.³ F16H *47/08, 47/00*
U.S. Cl. 74—688 **2 Claims**

1. A transmission comprising:
an input means;
an output means;
planetary gearing means disposed between said input means and said output means for providing one reverse speed ratio and four forward speed ratios with the fourth forward speed ratio being an overdrive ratio;
said planetary gearing means being operatively associated with a first friction clutch and a second friction clutch and first, second and third reaction brakes and first, second, third and fourth members;
a hydrodynamic torque converter operatively associated with said planetary gearing means and through which drive from said input means to said output means is provided in reverse speed ratio and first speed ratio only, said hydrodynamic torque converter being drivably connected to said first friction clutch and being arranged to be driven from said input means and drivably connected to said second friction clutch which is driven directly and mechanically from said input means, said hydrodynamic torque converter including an impeller, a stator and a turbine;
a one-way clutch provided between said impeller and said turbine to prevent said turbine from rotating at a higher forward speed than said impeller to eliminate power loss in the third speed ratio;
said first member being arranged to be driven from said input means through said fluid coupling and said first



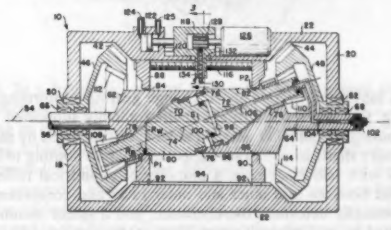
clutch in reverse speed ratio, first speed ratio and third speed ratio;
said second member being arranged to be driven directly from said input means in said second speed ratio and said third speed ratio and held stationary through said first reaction brake in reverse speed ratio;
said third member being arranged to be held stationary through said second reaction brake in said first speed ratio and said second speed ratio;
said fourth member being permanently connected to said output means; and
said third reaction brake being provided to operatively hold said first member stationary to provide said fourth speed ratio from said planetary gearing means and said second member being driven through said second friction clutch in said fourth speed ratio.

4,296,647

DIFFERENTIAL TRANSMISSION DRIVE UNIT

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Filed May 30, 1979, Ser. No. 43,686
Int. Cl.³ F16H *37/06, 15/16, 37/08, 15/50*
U.S. Cl. 74—690 **18 Claims**



1. A differential transmission unit for transmitting a mechanical power input to a pair of independently rotatable outputs, said unit comprising:
a unit frame defining a first axis;

an alpha body supported by said frame for rotation on said first axis;

a pair of beta bodies carried by said alpha body on a second axis inclined with respect to and intersecting said first axis at a point of axes intersection, said beta bodies being axially spaced to be positioned on opposite sides of said point of axes intersection and each having a beta rolling surface of revolution about said second axis;

a pair of omega bodies supported by said frame and each having an omega rolling surface of revolution about said first axis, said omega rolling surfaces being positioned on opposite sides of said point of axes intersection;

said beta and omega rolling surfaces being in frictional engagement at two contact points located one on each side of said point of axes intersection thereby to establish one such contact point between each beta and omega body of said pairs and whereby nutational movement of said beta body pair results in torque transmission between said beta and omega rolling surfaces, at least one of said beta and omega rolling surfaces having variable radii along the length thereof relative to the other of said beta and omega surfaces so that the ratio of beta/omega surface radii at said contact points is varied by relative shifting of said beta and omega bodies;

means for drivably connecting the power input and said alpha body;

a pair of rotatable unit output shafts;

means for supporting the respective bodies of one pair of said beta and omega bodies for independent rotation;

means drivably connecting said one pair of said beta and omega bodies to said pair of output shafts;

means holding the other of said beta and omega body pairs against rotation on the rolling surface axis thereof; and

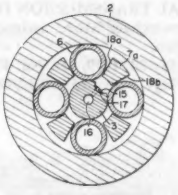
means for relative shifting of said beta and omega bodies in frictional engagement at each of said two contact points to vary the ratio of beta/omega surface radii independently at said respective contact points.

4,296,648

LUBRICATED FRICTION SPEED CHANGE GEARING

Hiroshi Okano, and Akira Sato, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Kabushiki Kaisha Fujikoshi, Toyama, both of, Japan

Filed Oct. 16, 1979, Ser. No. 85,256
Claims priority, application Japan, Dec. 15, 1978, 53-156712
Int. Cl.[3] F16H *13/08*
U.S. Cl. 74—798 **4 Claims**



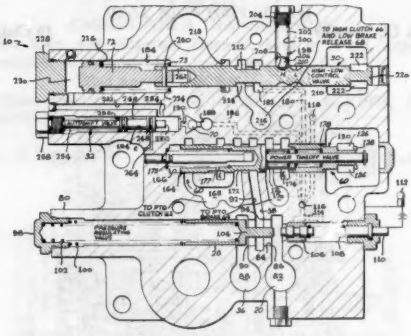
1. A lubricated friction speed change gearing comprising a housing, first and second rotary shafts rotatably supported in said housing on collinear axes, an inner race supported by said first rotary shaft, an outer race supported by said housing to be coaxial with said inner race, a plurality of cylindrical rollers mounted between said inner and outer races and compressed and elastically deformed therebetween, and a spider member supported by said second rotary shaft to engage among said rollers in sliding contact therewith and arranged to drive or be driven by said rollers when they perform planetary movement, said spider member having substantially plane rigid surfaces at its portions where it opposes and slidingly contacts said rollers, said surfaces each having a groove extending in the direction of relative movement of the outer surfaces of the co-operating rollers.

4,296,649

HYDRAULICALLY OPERATED TRANSMISSION CONTROL

Gordon L. Marquart, Jesup, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 4, 1979, Ser. No. 27,158
Int. Cl.[3] F16H *5/78;* F16D *67/04;* B60K *17/34*
U.S. Cl. 74—751 **20 Claims**



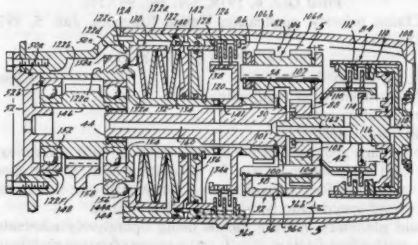
1. A control device for a transmission comprising the combination of a source of pressurized fluid, a housing, a pressure regulating valve mounted within the housing, a first chamber within the housing communicating with the pressure regulating valve, means coupling the source of pressurized fluid to the first chamber, an additional chamber within the housing connecting with the pressure regulating valve for providing a path for pressurized fluid provided the first chamber by the source of pressurized fluid, and means for coupling the additional chamber to the transmission to provide pressurized fluid to the transmission, the pressure regulating valve normally coupling the additional chamber to the first chamber and including means responsive to fluid pressure below a predetermined threshold value within the first chamber for cutting off the first chamber from the additional chamber.

4,296,650

TWO-SPEED TRANSAXLE

Ilmars Kalns, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 25, 1979, Ser. No. 51,576
Int. Cl.[3] F16H *37/08, 3/74, 3/56*
U.S. Cl. 74—751 **7 Claims**



1. A transmission comprising:

a housing;

an input and output means mounted for rotation in said housing;

a planetary gear set including an input member rotatably driven by said input means, an output member rotatably driving said output means, and a rotatable reaction member;

a clutch mechanism operative when applied to prevent relative rotation between said members for locking said planetary gear set and effecting a one-to-one speed ratio between said input and output members and operative when released to allow said relative rotation;

a brake mechanism operative when applied to prevent rotation of said reaction member for effecting a different speed ratio between said input and output members and operative when released to allow rotation of said reaction member; and

first and second means operative to apply and release said mechanisms, said first means including preloaded spring means for applying one of said mechanisms and means responsive to pressurized fluid for opposing the force of spring means and releasing said one mechanism, and said second means including means responsive to pressurized fluid for applying the other of said mechanisms and means operative to release said other mechanism in the absence of said pressurized fluid, whereby one of said speed ratios is effected in the absence of pressurized fluid to both of said mechanisms and whereby the other speed ratio is effected in the presence of said pressurized fluid to both of said mechanisms.

4,296,651

AUTOMATIC POWER TRANSMISSION SHIFT VALVE

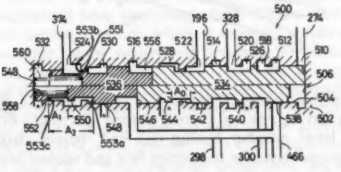
Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 24, 1978, Ser. No. 963,648

Claims priority, application Japan, Sep. 5, 1978, 53-108039

Int. Cl.³ B60K *41/06, 41/10*

U.S. Cl. 74—869 **15 Claims**



1. A hydraulic control system for an automatic transmission for a motor vehicle, the transmission being shiftable by at least one servo-actuator between a plurality of gear ratios, including at least a pair of relatively higher and lower forward drive ratios, the control system comprising:

a source of fluid;

means communicating with said source of fluid for producing in the hydraulic system a plurality of fluid pressures including a control pressure variable with operating conditions of the motor vehicle, an actuating fluid pressure selectively fed to the servo-actuator to effect shifting between gear ratios, and a kickdown fluid pressure for overriding said control fluid pressure in response to a vehicle condition wherein sudden acceleration is required;

a shift valve, including a movable valve element, communicating with said producing means such that said control pressure effects controlled movement of said valve element in response to vehicle operating conditions and such that movement of said valve element effects selective communication of fluid under the actuating pressure with the servo-actuator to cause shifting from one gear ratio to another, said valve element including a first position for establishing the lower gear ratio and a second position for establishing the higher gear ratio;

said valve element including a first effective kickdown pressure acting area which is selectively exposed to said kickdown pressure when said valve element is in said first position; said first effective kickdown pressure area, when acted upon by said kickdown pressure, urging said valve element to remain in said first position;

said valve element including a second effective kickdown pressure acting area, which is different in area from said first effective kickdown pressure acting area, and which is selectively exposed to said kickdown pressure when said valve element is in said second position, said second effective kickdown pressure area, when acted upon by said kickdown pressure, urging said valve element to move from said second position to said first position;

a passageway extending between said producing means and said shift valve to effect communication therebetween;

a single kickdown pressure port in said shift valve effecting communication between said passageway and both said first and second kickdown pressure acting area.

4,296,652

HYDRAULIC CONTROL FOR AN AUTOMATIC VEHICLE TRANSMISSION

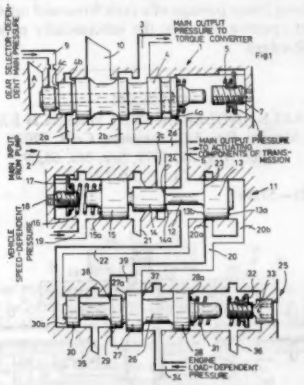
Gerd Oberpichler, Brunswick, and Ernst-August Honig, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,204

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832345

Int. Cl.³ B60K *41/06*

U.S. Cl. 74—868 **5 Claims**



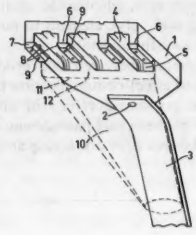
1. In a hydraulic control device for an automatic vehicle transmission including a main pressure control valve for delivering an engine load-dependent main output pressure for operating actuating components of the vehicle transmission; and a pressure-limiting valve for delivering an engine load-dependent, upwardly limited control pressure; said pressure-limiting valve including a control piston exposed to said control pressure and to the force of a spring opposing the control pressure; the improvement comprising an additional control valve means for applying to said main pressure control valve an output pressure being a function of a vehicle speed-dependent pressure and said control pressure and being modulated by said control pressure and a higher main input pressure.

4,296,653

METHOD AND A DEVICE FOR REMOVING CORKS FROM VESSELS

Sune I. Lundgren, Lulea, and Leif E. L. Rehnberg, Boden, both of Sweden, assignors to Kemi-Intressen AB, Sundbyberg, Sweden

PCT No. PCT/SE78/00070, § 371 Date Jun. 20, 1979, § 102(e) Date Jun. 20, 1979, PCT Pub. No. WO79/00268, PCT Pub. Date May 17, 1979
PCT Filed Nov. 8, 1978, Ser. No. 118,803
Claims priority, application Sweden, Nov. 10, 1977, 7712690
Int. Cl.[3] B67B 7/00
U.S. Cl. 81—3.46 R 9 Claims



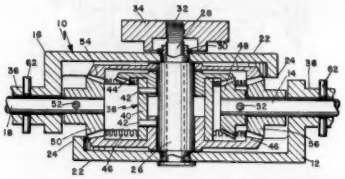
3. A device for removing corks from vessels in situations when the upper part of the cork extends above the orifice of the vessel, which device comprises two elongated knives, each equipped with a knife-edge, and a holding device which supports the knives in a spaced apart relationship in the same horizontal plane and fixes the knives with their knive-edges oriented substantially parallel to each other in the same horizontal plane, directed towards each other and separated by a distance less than the largest diameter of the cork to be removed, said holding device having an inlet opening and an outlet opening and being elongated so as to form a free space which allows linear passage of a cork from said inlet opening to said outlet opening between the substantially parallel spaced apart knife-edges.

4,296,654

ADJUSTABLE ANGLED SOCKET WRENCH EXTENSION

Albert E. Mercer, Box 531, Jacumba, Calif. 92034

Filed Aug. 20, 1979, Ser. No. 68,097
Int. Cl.[3] B25B 17/00
U.S. Cl. 81—57.26 8 Claims



1. A tool drive mechanism for producing a rotational motion at an output shaft from a selectable motion at an input shaft, said drive mechanism comprising:

(a) an input shaft mounting bracket having said input shaft captured in journaled relation therein such that said shaft is rotational about its longitudinal axis;

(b) an output shaft mounting bracket having said output shaft captured in journaled relation therein, such that said shaft is rotational about its longitudinal axis;

(c) said mounting brackets being pivotally interconnected to define an axis of angular adjustment perpendicular to the rotational axes of said shafts and permitting relative pivotal motion of said shafts in their respective brackets in a common plane substantially including the shafts;

(d) each of said shafts having a pivotally inner end mounting an integral bevel shaft gear captured by the mounting bracket which mounts same;

(e) a gear spool rotational between said brackets about said axis of angular adjustment and defining two inwardly facing bevel gears engaging respective ones of said shaft gears whereby clockwise rotation of one of said shafts about its longitudinal axis produces clockwise motion of the other of said shafts about its longitudinal axis such that rotation of a first one of said shafts can be selectable caused by either the rotation of the other shaft about its longitudinal axis, or the non-rotational pivoting of the other shaft about said axis of angular adjustment, or the non-rotational pivoting of the other shaft about the longitudinal axis of said first one of said shafts;

(f) each of said shaft gears, on the side thereof opposite the side engaging the respective inwardly facing bevel gear, engaging a gear in idling relation; and,

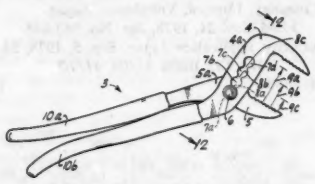
(g) one of said shafts having an idler gear journaled thereon engaging the inwardly facing bevel gear which engages a shaft gear of the other of said shafts, and the last-mentioned gear engaging an inwardly facing idler beveled gear journaled coaxially with the first-mentioned two inwardly facing beveled gears.

4,296,655

SLIP JOINT PLIERS

Joseph Tesoro, 9 Dade Rd., New City, N.Y. 10956

Filed May 12, 1980, Ser. No. 149,043
Int. Cl.[3] B25B 7/04
U.S. Cl. 81—405 4 Claims



1. Slip joint pliers comprising in combination: a first lever member having one end thereof shaped as a plier's first jaw; a second lever member having one end thereof shaped as a plier's second jaw; the respective first and second lever members having respectively first and second handles; the first lever member having a first single through-aperture intermediate between said first jaw and said first handle; the second lever member having a plurality of consecutively aligned through-apertures in series interconnected by a series of consecutive joining-through-apaces; each consecutive joining-through-space being of samller linear distance between opposing spaced-apart walls than diameter of each of said plurality of consecutively aligned through-apertures; and said first single through-aperture and said plurality each having substantially the same diameters; and pivot means mounted axially through said first single through-aperture and at-least one of said plurality, said pivot means being for pivoting said first and second lever members, and the pivot means including first and second portions continuous with one-another and axially-aligned end-to-end with one-another with the first portion being of a diameter greater than said smaller linear distance and lesser than said diameters of each of said plurality and with the second portion being of a diameter smaller than said smaller linear distance, whereby the first portion is retainable against lateral movement when mounted within one of said plurality and whereby the second portion is movable through said consecutive joining-through-spaces alternately when the second portion is mounted within one of said plurality, said first portion

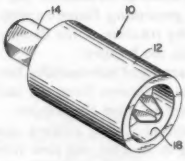
being axially movable to and from any one of said plurality and said second portion being mounted within at least one of said plurality when said first portion is removed therefrom whereby said first lever member may be shifted to alternate pivot positions of said plurality of said second lever member when said first portion is removed from a pivot position of one of said plurality, said pivot means including a spring normally spring biasing said first portion into a pivot-mounting position within one of said plurality, said spring being a coil spring, said first and second portions being of cylindrical shapes and with central axially-extending bores and said coil spring being mounted substantially within said bores, the pivot means additionally including a lock pin and the second portion including an axially-extending slot therein with said lock pin locking said pin to said larger portion and said lock pin being mounted through said axially-extending slot.

4,296,656

DRIVER BIT ATTACHMENT

Richard J. Ernst, Palatine, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 21, 1980, Ser. No. 141,863
Int. Cl.³ B25B *23/00*
U.S. Cl. 81—429 **5 Claims**



1. An attachment for a power tool to permit driving of threaded fasteners said attachment comprising a generally cylindrical body; projection means extending from one end of said body, said projection means being adapted for connection to said power tool to receive rotational torque therefrom; a first longitudinal bore extending axially within said body; a driver bit having a portion which is received within said first bore; securing means within said first bore for retaining the driver bit therein; a second bore which has a larger mean diameter than said first bore, said second bore extending from said first bore to the end opposite the end having the projection, said second bore having an axial length approximately equal to the height of the fastener head with which the adaptor is to be used and a mean diameter larger than the maximum width dimension of the fastener head, a portion of said driver bit being received therein; a set screw threadingly engaged in a tapped hole in the the projecting means and extending into said first bore from said projection means end to position the driver bit within the first and second bores so that the point of disengagement of the driver bit from the fastener head may be varied in order to prevent over torquing of the fastener.

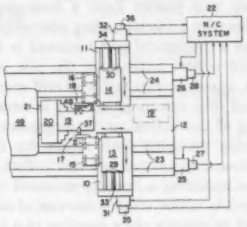
4,296,657

METHOD AND APPARATUS FOR POSITIONING WORK ON A NUMERICALLY CONTROLLED LATHE

Shoichi Yasuba, Seto, and Takaharu Ito, Kasugai, both of Japan, assignors to Okuma Machinery Works, Ltd., Nagoya, Japan

Filed Mar. 18, 1980, Ser. No. 131,540
Claims priority, application Japan, Mar. 23, 1979, 54/34840
Int. Cl.³ B23B *3/00, 13/00, 3/16*
U.S. Cl. 82—1 C **10 Claims**

1. In a numerically controlled lathe, a method of automatically carrying work from a preassigned standby position on the lathe to a machining position, which method comprises providing a pair of saddles which are mounted on a lathe bed for movement in a first direction as dictated by a numerical control system, providing a pair of cross slides which are mounted on the respective saddles for movement in a second direction at right angles to the first direction as dictated by the numerical control system, the cross slides having mounted thereon a cooperative pair of gripper means for releasably engaging and holding the work therebetween, causing the numerical control system to move the pair of saddles to such positions that the



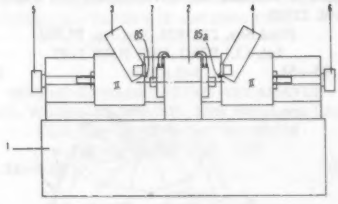
pair of gripper means are located on opposite sides of the work lying in the standby position, causing the numerical control system to move the pair of cross slides toward each other until the work is engaged between the pair of gripper means, and causing the numerical control system to move at least the pair of saddles for carrying the work to the machining position.

4,296,658

CLAMPING DEVICE FOR SIMULTANEOUSLY MACHINING INTERNALLY AND/OR EXTERNALLY, THE TWO ENDS OF A WORKPIECE

Marcel Champeau, Niort, and Andre Tabutin, La Celle Saint Cloud, both of France, assignors to Societe Anonyme dite: Ramo S.A., France

Filed Jun. 25, 1979, Ser. No. 51,796
Claims priority, application France, Jun. 30, 1978, 78 19632
Int. Cl.³ B23B *19/02, 25/06*
U.S. Cl. 82—30 **7 Claims**



1. A clamping device for simultaneously machining, internally and/or externally, two ends of a workpiece, comprising a headstock housing in which a tubular spindle is mounted to rotate, said spindle being internally provided with two annular, monolithic pistons sliding axially and acting respectively on two collets for clamping the workpiece, located at both ends of said spindle, wherein said clamping collets which are respectively mounted in said two pistons have a cone-shaped portion, which cooperates with a corresponding cone-shaped portion in said pistons, and a cylindrical part centered in the boring of said pistons, said collets resting, on the side opposite their cylindrical part, against covers fast with said spindle by means of a cone-shaped face extending radially in order to allow a radial tightening of said collets on the workpiece, and wherein a central sleeve is placed inside said pistons and constitutes a spacer against the ends of which abut said cylindrical parts of said collets so as to ensure the guiding and the positioning of the workpiece in said collets, said central sleeve being provided at its two ends with flanges engaging corresponding counterborings in said collets.

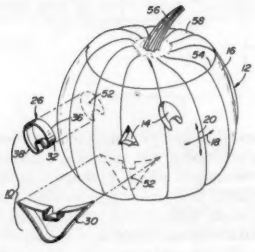
5. A clamping device for simultaneously machining, internally and/or externally, two ends of a workpiece, comprising a headstock housing in which a tubular spindle is mounted to rotate, said spindle being internally provided with two annular pistons sliding axially and acting respectively on two collets for clamping the workpiece, located at both ends of said spindle, wherein said clamping collets which are respectively mounted in said two pistons have a cone-shaped portion, which cooperates with a corresponding cone-shaped portion in said pistons, and a cylindrical part centered in the boring of said pistons, said collets resting, on the side opposite their cylindrical part, against covers fast with said spindle by means of a cone-shaped face extending radially in order to allow a radial tightening of said collets on the workpiece, each end of said spindle being provided with means for detecting the clamping and loosening positions of said collets, each of said detecting means including a housing mounted on said headstock housing and in which extends one end of said spindle on which is secured an annular piece carrying two collars, fast in rotation with said spindle and adapted to move radially, one by a means sensitive to the movement of the collet while in the clamping position and the other by a means sensitive to the movement of the collet while in the loosening position, said collars being provided with a magnetic screen cooperating, when said collars are in an eccentric position, with members for detecting the clamping and loosening positions of the collet.

4,296,659

JACK-O-LANTERN FORMING METHOD

Christopher A. Nauman, 160-A Willowdale Dr., #103, Frederick, Md. 21701

Filed Sep. 21, 1979, Ser. No. 77,554
Int. Cl.³ B26D *3/00*; B26F *1/46*
U.S. Cl. 83—54 **6 Claims**



1. A method of forming a Jack-O-Lantern from a pumpkin including the steps of:

(a) providing a closed contour pumpkin die element defining a continuous sidewall element forming a through opening, said pumpkin die element having an upper edge and a lower edge;

(b) positioning said pumpkin die element adjacent an outer surface of said pumpkin at a predetermined location;

(c) striking said upper edge of said pumpkin die element; and,

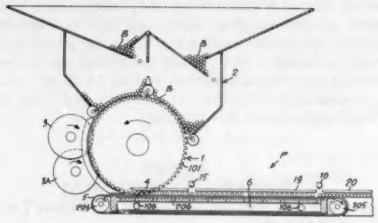
(d) displacing said pumpkin die element entirely through a wall of said pumpkin to a position internal said pumpkin.

4,296,660

DEVICE FOR FEEDING ROD-LIKE ARTICLES

Athos Cristiani, Bologna, Italy, assignor to CIR - S.p.A. Divisione SASIB, Bologna, Italy

Filed Jan. 19, 1979, Ser. No. 4,873
Claims priority, application Italy, Jan. 31, 1978, 12445 A/78
Int. Cl.³ A24C *5/50*; B26D *7/06*; B23Q *7/16*; B65G *65//42*
U.S. Cl. 83—100 **8 Claims**



1. A device for feeding rod-like articles, such as cigarette filter plugs, comprising, in combination:

(a) a hopper for containing a bulk supply of the articles, said hopper being closed at its bottom end by a rotatable removing drum presenting flutes capable of housing said articles, whereby rotation of the drum causes removal of the articles from the hopper;

(b) a suction belt arranged substantially horizontal below the removing drum to receive from the said removing drum the articles removed from the hopper;

(c) a fixed horizontal sliding surface which receives the articles moving in at least one row transversely to their length, the movement of the articles on the said sliding surface being caused by the pushing action of the articles delivered from the suction belt;

(d) an abutment member provided at the delivery end of the fixed sliding surface, in order to stop the horizontal movement of the leading article of the row of articles on the sliding surface;

(e) a rotatable collecting drum arranged at the delivery end of the fixed sliding surface, and provided with pick-up elements for collecting the leading article which has been stopped by the said abutment member.

5. A device according to claim 1, in which the articles are multiple length filter or cigarette rods, further comprising cutting means arranged in the arc of the removing drum between the hopper and the delivery point on the suction belt, said cutting means being provided to cut the articles in at least two segments; and parallel and interspaced side partitions provided along the said suction belt and along the said fixed sliding surface in order to subdivide the said suction belt and sliding surface into at least two parallel longitudinal tracks, each track terminating with an abutment member for stopping the leading segment of each row of segments.

4,296,661

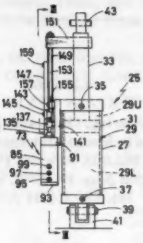
FEED CONTROL FOR HORIZONTAL BANDSAW MACHINES

Tomonobu Kaneko, Isehara, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Apr. 24, 1979, Ser. No. 32,924
Claims priority, application Japan, Apr. 28, 1978, 53-50155; Apr. 28, 1978, 53-50156
Int. Cl.³ B23D *53/04*; B27B *13/04*
U.S. Cl. 83—796 **2 Claims**

1. In a horizontal bandsaw machine having a hydraulic piston-cylinder unit for pivotally operating a cutting head assembly relative to a fixed base, wherein the flow of hydraulic fluid bled from unit during a cutting operation is controlled by a valve which is adjusted in response to movement of a cam follower along an inclined cam surface, the improvement

comprising: the cam surface and the cam follower being connected respectively to the piston and cylinder of said unit in a



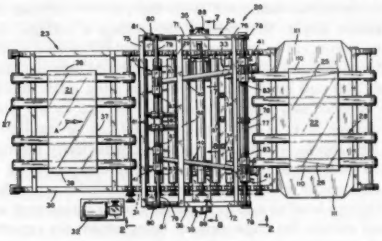
manner such that axial movement of said piston relative to said cylinder will produce corresponding movement of said cam surface relative to said cam follower.

4,296,662

METHOD OF AND APPARATUS FOR CUTTING SHEETS OF GLASS

Ronald R. Reed, Toledo; William F. Crone, Jr., Bowling Green, and G. Robert Meyer, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Mar. 17, 1980, Ser. No. 130,746
Int. Cl.[3] B26D *3/08*; C03B *33/02*
U.S. Cl. 83—880 **11 Claims**



4. An apparatus for scoring glass sheets, the apparatus comprising:

a. a scoring station;

b. a continuously operating means for conveying the glass sheets along a rectilinear path beneath said scoring station and for supporting the glass sheet at said scoring station;

c. means for capturing and holding the glass sheet in a stationary position at the scoring station during scoring of the glass sheet;

d. at least one guide rail extending along the rectilinear path at an angle other than 90° relative thereto, and bridged over the glass sheets above said predetermined location;

e. means for positionably suspending said guide rail above said conveying means above said predetermined location of the glass sheet; and

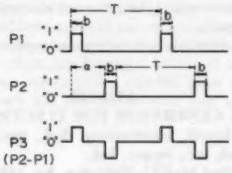
f. a scoring tool movable along said guide rail for scoring the captured glass sheet along a predetermined path.

4,296,663

ELECTRONIC MUSICAL INSTRUMENT

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 13, 1979, Ser. No. 75,227
Claims priority, application Japan, Sep. 14, 1978, 53-113735; Sep. 14, 1978, 53-127397[U]
Int. Cl.[3] G10H *1/00*
U.S. Cl. 84—1.01 **10 Claims**



1. An electronic musical instrument comprising:

keyboard means including keys to be operated for musical performance;

a pulse signal generating circuit connected to said keyboard means and for generating a pluality of pulse trains of a same frequency corresponding to the tonal pitch of the operated key but of different phases, each said pulse train being constituted by "logic 1's" and "logic 0's";

an envelope waveshape generator connected to said keyboard means and for generating an envelope waveshape having a selected polarity upon every key operation; and

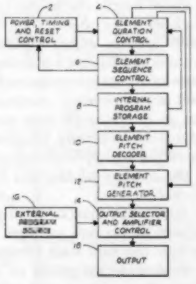
musical tone waveshape generating means for sampling said envelope wavehshape and selectively reversing the polarity of sampled values therefrom, said musical tone waveshape generating means being connected to said pulse signal generating circuit and to said envelope waveshape generator, and sampling said envelope waveshape as a function of said pulse trains applied thereto, and said musical tone waveshape generating means further acting to reverse the polarity of sampled values of said envelope waveshape as a function of said pulse trains.

4,296,664

SOUND BROADCASTING APPARATUS

Kenneth O. Woolbright, 5601 NW. 37th, Oklahoma City, Okla.

Filed Nov. 19, 1979, Ser. No. 95,424
Int. Cl.[3] G10H *1/42, 7/00*
U.S. Cl. 84—1.03 **9 Claims**



1. An apparatus for reproducing sound from data electrically stored in an electronic memory device, said apparatus comprising:

timing control means;

element duration control means including a first counter

receiving input from said timing control and means providing output to a first pulse generator;

element sequence control means including a second counter controlled by said element duration control means, and including a first controllable switch means;

internal program storage means controlled by said element duration control means and said first controllable switch means to provide data output;

element pitch decoder means receiving said data output to output retrieved individual signal elements;

means for converting the retrieved elements into respective audio signals;

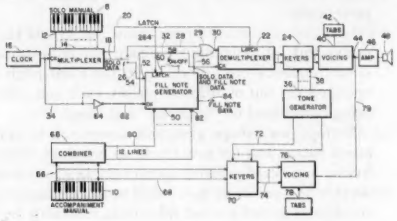
means for audibly broadcasting the respective audio signals.

4,296,665

FILL NOTE GENERATOR FOR ELECTRONIC ORGAN

Stephen L. Howell, Huntingburg, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed May 12, 1980, Ser. No. 149,262
Int. Cl.[3] G10F *1/00*; G10H *1/02*
U.S. Cl. 84—1.03 **20 Claims**



1. An electronic musical instrument comprising:

a keyboard having a plurality of playing keys actuating respective keyswitches and comprising a solo portion customarily played by the right hand and an accompaniment portion customarily played by the left hand, said playing keys corresponding to notes of the musical scale,

multiplexer means for scanning the keyswitches of the solo portion of said keyboard and generating on an output a time division multiplexed solo data stream on each scan of the keyboard comprising keydown signals in respective discrete time slots for each actuated keyswitch of the solo portion of the keyboard,

at least a group of the keyswitches of the accompaniment portion of the keyboard being interconnected in a plurality of sets such that each set comprises all of the keyswitches in said group corresponding to a particular diverse pitch of an octave length chromatic scale, and the keyswitches in each set being connected to a common output,

a multistage shift register means synchronized with said multiplexer means and having a plurality of load inputs at respective ones of its stages connected to the respective outputs of said accompaniment portion keyswitches, and producing on an output a fill note time division multiplexed data stream comprising keydown signals in time slots corresponding to keydown signals loaded into its inputs from the outputs of the sets of accompaniment portion keyswitches,

window means having an input connected to the output of said shift register means and an input connected to the output on which the solo data stream appears and an output, said window means gating to its output the data stream on the output of said shift register means for a predetermined number of time slots following receipt by said window means of a predetermined keydown signal in the solo data stream, and

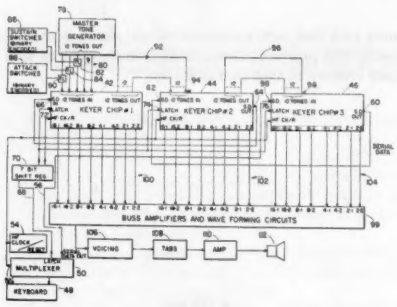
output means connected to the output of said window means and controlled by the fill note data stream on the output of said window means for producing tones in accordance with the keydown signals in the fill note data stream on the output of said window means.

4,296,666

SOLO SUSTAIN KEYER SYSTEM

Brian N. Wilcox, Kettering, Ohio, and John W. Robinson, Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Division of Ser. No. 962,003, Nov. 20, 1978, Pat. No. 4,217,801.
This application May 15, 1980, Ser. No. 150,089
Int. Cl.[3] G10H *1/02*
U.S. Cl. 84—1.26 **3 Claims**

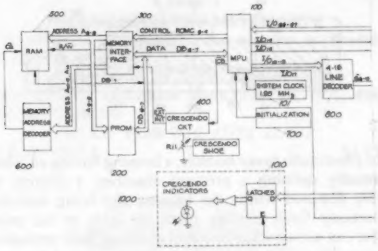


1. In an electronic organ or the like having a source of tone signals, a plurality of keyers each including a control terminal, and keyboard controlled means for selectively supplying keyer actuating voltages to the control terminals of the keyers, a plurality of envelope generators interposed between the keyboard controlled means and the keyers each comprising: an input terminal connected with the keyer actuating voltage, an output terminal connected with the control terminal of the respective keyer, first means for storing a voltage, second means connected to said output terminal for storing a voltage, third variable conductivity means connected between said first means and said input terminal for providing when actuated a path between said input terminal and said first means whereby the voltage level at said input terminal can be transferred to said first means, and fourth variable conductivity means connected between said first and second means providing when actuated a path between said first and second means whereby the voltage level at said first means can be transferred to said second means, the improvement being means for repetitively and alternately actuating said third and fourth means to transfer the voltage level at said input through said first means to said second means by increments over a period of time comprising a clock driven counter having a variable effective count length and having its output connected to said third and fourth means for actuating the same, and means connected to said counter for varying the effective count length of said counter so as to vary the rate at which said third and fourth means are repetitively and cyclically actuated, said means for varying the effective length of said counter comprising a source of count length control signals, and said means for varying comprising a plurality of multilevel decoders connected respectively to the count length control signals, each said decoder having one input terminal connected to at least one of said count length control signals and to at least one of the tone signals and further having a plurality of outputs on which the signals on its input terminal appear, respectively, the outputs of said multilevel decoders that carry the tone signals being operatively coupled to respective ones of the keyers.

4,296,667
CAPTURE COMBINATION ACTION SYSTEM FOR ELECTRONIC ORGANS

David R. Wade, Cincinnati, Ohio, and Walter Munch, Ft. Thomas, Ky., assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Feb. 14, 1980, Ser. No. 121,591
Int. Cl.[3] G09B 15/00; G10B 3/10
U.S. Cl. 84—345 26 Claims



1. A capture combination action system for use in an electronic organ for selecting a predetermined combination of stops to define the organ voicing, said system comprising:

a. a plurality of stop tabs for setting and resetting said stops, each of said tabs including a switch having a pair of normally open contacts which are momentarily closed to provide an electrical path when said tab is manually actuated by the organist;

b. a plurality of pistons for setting a desired combination of said stops to a predetermined condition, each of said pistons including a pair of normally open contacts which are closed to provide an electrical path when said piston is actuated;

c. random access memory means for storing data and for storing the current status of all organ stops associated with a selected combination of stops;

d. read only memory means containing a permanently stored operating program comprising a plurality of operating instructions; and

e. processing means responsive to said operating instructions including;

i. means for continually and sequentially scanning each pair of said stop tab and piston contacts to detect a contact closure;

ii. means for selecting stops having contacts detected momentarily closed by said scanning means;

iii. means for storing in said random access memory means data associated with a selected one of said pistons for a selected combination of stops;

iv. means for recalling from said random access memory means said selected stop combination data when said scanning means detects closure of said selected piston contacts;

v. means utilizing said recalled data to select said combination of stops and;

vi. means responsive to said scanning means for continually updating the data stored in said memory means to reflect the current status of all organ stops.

4,296,668
REED PROTECTOR FOR A WOODWIND INSTRUMENT

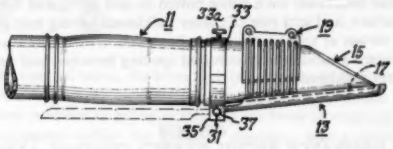
Robert A. Lorenzini, P.O. Box 91, Hancock, Mass. 01237

Continuation-in-part of Ser. No. 967,989, Dec. 11, 1978, abandoned. This application Apr. 25, 1980, Ser. No. 143,753
Int. Cl.[3] G03D 9/02
U.S. Cl. 84—383 R 2 Claims

1. An improved reed protector for a mouthpiece of a woodwind instrument utilizing a reed held by a ligature, said instrument having a back end where the mouthpiece is located and a forward end opposite from said mouthpiece, said improvement comprising:

a sleeve adapted to slip fit over the mouthpiece of a woodwind instrument, and to be located on the mouthpiece adjacent and separate from the ligature toward the forward end of said instrument, the interior of said sleeve being generally circular, a pair of protrusions, parallel to one another and extending from the exterior of said sleeve, each of said protrusions having interior surfaces which face each other, the interior of said sleeve including a flat sector located between said pair of protrusions for providing clearance between said sleeve and said reed;

a unitary protective cap having a back end and a forward end with two substantially parallel sides extending between the back end and the forward end, said protective cap being rotatably mounted on the pair of protrusions, and being adapted to be held in its protective position over the reed on the mouthpiece and being adapted to be held in its playing position away from the reed and on the instrument;



each of said protrusions having an opening therein;

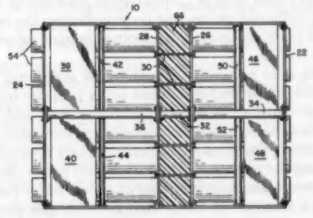
said unitary protective cap having a reinforced bar at its forward end, said reinforced bar having pins extending from each end, said pins mounted in said openings on said protrusions for rotatably mounting said unitary protective cap;

said reinforced bar having two pair of lugs thereon, one pair of lugs engaging a portion of said sleeve between said protrusions to hold said protective cap in its protective position, the other pair of lugs engaging a portion of said sleeve between said protrusions to hold said protective cap in its playing position.

4,296,669
ROCKET TUBE LAUNCHER WITH CAST-IN PLACE TUBE SUPPORT BULKHEAD

Edward J. Debona; Boyd L. Neblett; Walter J. Krueger; William J. Laird; Billy H. Campbell, and Gerald H. Matthews, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 25, 1979, Ser. No. 42,667
Int. Cl.[3] F41F 3/04
U.S. Cl. 89—1.816 7 Claims



1. A rocket tube launcher comprising an elongated housing structure having forward and rear ends, a rear bulkhead mounted at said rear end of said elongated housing structure, a

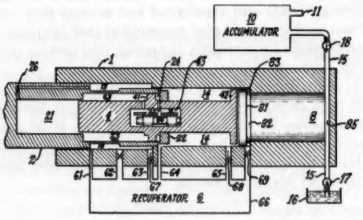
forward bulkhead mounted at said forward end of said elongated housing structure, a pair of center bulkheads mounted in said elongated housing structure and being relatively close together relative to the spacing between said pair of center bulkheads and said forward and rear bulkheads; each of said rear bulkhead, said forward bulkhead, and said pair of center bulkheads having a multiplicity of openings therethrough with the openings of each bulkhead being aligned with the openings of each of the other bulkheads; a launch tube mounted in each of said openings and being welded to the forward bulkhead and secured to the rear bulkhead; rigid foam means of polyurethane foam mounted between said pair of center bulkheads and surrounding the launch tubes to provide a unibody structural support for the launch tubes near a center portion thereof, center structural support means secured to said front bulkhead, said rear bulkhead, said center bulkheads and said elongated housing structure to brace these members relative to each other, said front bulkhead, said rear bulkhead, and said pair of center bulkheads each being bolted to said elongated housing structure, and said pair of center bulkheads having bolt securing means at spaced positions about said center bulkheads to maintain a substantially constant spacing between said pair of center bulkheads.

4,296,670

ORDNANCE RECOIL ENERGY CONTROL AND RECOVERY SYSTEM

Robert P. Northup, and Robert L. Anderson, both of Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,336
Int. Cl.³ F41F *19/14*
U.S. Cl. 89—43 R **15 Claims**



1. A recoil mechanism for controlling movement of a recoil mass relative to a mount comprising:

(a) a pressurized gas recuperator system including available capacity gas chamber means interconnecting said recoil mass and said mount for opposing recoil, for collecting recoil energy in the form of gas pressure in a gas recuperator as recoil movement of said recoil mass decreases the capacity of said variable capacity gas chamber means forcing gas therefrom into said gas recuperator, for driving said recoil mass in counterrecoil with use of only part of said collected energy and for transferring the remainder of said collected energy to another system subsequent to counterrecoil;

(b) a hydraulic accumulator system for supplying, holding and distributing hydraulic fluid under pressure including a variable capacity hydraulic pump chamber; and

(c) interface means responsive to said gas recuperator means for utilizing gas pressure collected in said recuperator for reducing the capacity of said hydraulic pump chamber to force hydraulic fluid from said chamber under pressure to effect a transfer of recoil energy from gas pressure to hydraulic pressure,

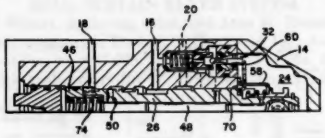
whereby recoil energy can be generated and collected in the form of gas pressure during recoil, partially dissipated to drive the recoil mass in counterrecoil and thereafter transferred to a hydraulic system for use.

4,296,671

HYDRAULIC BRAKE BOOSTER AND CONTROL VALVE THEREFOR

Louis S. Tang, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 24, 1980, Ser. No. 114,799
Int. Cl.³ F15B *20/00*
U.S. Cl. 91—5 **11 Claims**



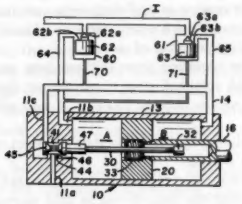
1. In a hydraulic brake booster, a housing having an inlet and substantially defining a pressure chamber, a control valve movably disposed within the housing and being operable to communicate fluid pressure from the inlet to the pressure chamber, an accumulator normally storing fluid pressure and communicating with the pressure chamber when the control valve is operable and the fluid pressure within the pressure chamber is below a predetermined value, valve means cooperating with the accumulator to normally close communication between the accumulator and the pressure chamber, a sleeve member carried by the control valve and being movable relative to the control valve to close communication between the inlet and the pressure chamber when the fluid pressure in the latter is below the predetermined value, and an annular member engageable with the valve means to open communication between the accumulator and the pressure chamber, characterized by the sleeve member including a portion which is engageable with the housing to limit movement of the sleeve member when the control valve is operable and the annular member is movable with the control valve when the portion is engageable with the housing to engage the annular member with the valve means.

4,296,672

RECIPROCATING PISTON-CYLINDER COMBINATION AND VALVING CONTROL THEREFOR

Harold G. Inhofer, Hopkins, Minn., assignor to Proteus Corporation, Minneapolis, Minn.

Filed Nov. 13, 1979, Ser. No. 93,876
Int. Cl.³ F01L *15/16, 25/06, 23/00*
U.S. Cl. 91—271 **9 Claims**



1. A reciprocating, piston-cylinder assembly and valving control therefore, including:

a. a cylinder;

b. a piston arranged for reciprocating movement within said cylinder;

c. means for providing fluid under pressure to said assembly;

d. a pair of inlet valving members receiving fluid under pressure and each being shiftable from a first open, fluid admitting position to direct fluid to one side of said piston for movement thereof to a second closed position;

e. said inlet valving members being fluidically connected to provide fluid under pressure from one of said valve members in said first position to the other of said valve members to positively hold said other of said valves in the second closed position; and,

f. a pair of exhaust valving members arranged to exhaust fluid from said cylinder in response to the movement of the piston therein.

4,296,673

POWER STEERING MECHANISM

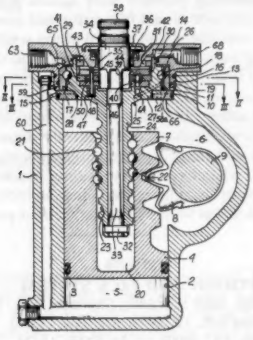
Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Jun. 8, 1978, Ser. No. 913,620

Claims priority, application Spain, Jun. 11, 1977, 459.711; Jun. 14, 1977, 459.740

Int. Cl.³ F15B *9/10, 15/22, 13/042*

U.S. Cl. 91—375 A **11 Claims**



1. Control valve in particular for power steering mechanism having rotatable coaxial input and output members, characterized in that said control valve comprises a substantially disc-shaped chamber defined in one of said input and output members and coaxial with said members, and a rotor rotatably connected to the other of said input and output members, said rotor sealingly separating said disc-shaped chamber into a plurality of peripheral chambers communicating alternately with corresponding working chambers of a double acting servo actuating cylinder of the power steering mechanism, at least one of the axial surfaces of the disc-shaped chamber being formed with ports connected alternately to the fluid inlet and outlet of a fluid supply and arranged at angular positions such as to be partially closed by the rotor when the valve is in its normal position, while in every operating position the inlet and outlet communicate with the corresponding chambers of the servo-actuator, one of the axial surfaces of the disc-shaped chamber being defined by a member movable along the axis of said chamber, between a first position in which it engages with the adjacent surface of the rotor to sealingly separate the distribution chambers, and a second position away from the rotor surface, in which second position it interconnects said distributing chambers and equalizes the pressure in the working chambers of the actuating cylinder.

4,296,674

QUICK TAKE-UP BRAKE BOOSTER

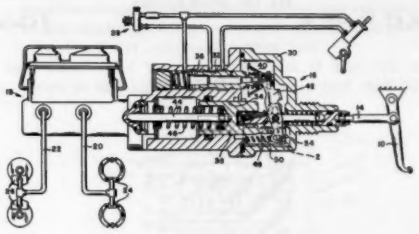
William E. Monroe, Syracuse, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 21, 1979, Ser. No. 50,912

Int. Cl.³ F15B *13/10*

U.S. Cl. 91—391 R **6 Claims**

1. In a hydraulic brake booster, a housing substantially defining a pressure chamber, a control valve cooperating with the housing to communicate fluid pressure to the pressure chamber, a pressure responsive member carried by the housing and movable in response to fluid pressure within the pressure chamber from a rest position to effectuate a brake application, an input member extending into the housing and being movable by an operator during a brake application, a lever engageable with the input member, the pressure responsive member



and the control valve, the lever forming a connection with the pressure responsive member which permits the pressure responsive member to move relative to the lever in response to fluid pressure within the pressure chamber, and a resilient member engages the housing and the lever to bias the latter to a rest position engaging the housing.

4,296,675

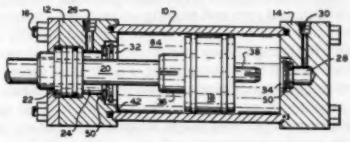
CYLINDER CUSHION WITH CONTRACTABLE RING

Paul E. Gies, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 16, 1979, Ser. No. 57,598

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—396 **6 Claims**



1. A fluid pressure actuator comprising, in combination, a cylinder defining a chamber and having a head provided with a port through which fluid may be admitted to the cylinder or exhausted therefrom, piston structure slidable in said cylinder toward and away from said head, an annular ring of non-compressible material mounted on said head adjacent and substantially coaxial to said port, said ring including annular inner and outer surfaces defining a radial dimension, said ring being severed through said radial dimension whereby the diametrical dimension of said ring may vary between a normal radially contracted diameter and a radially expanded diameter, an elongated valve member mounted on said piston structure telescopingly received within said port and ring when said piston structure is adjacent said head controlling the flow of fluid through said port, said valve member including an outer surface slidingly engaged by said ring inner surface, the normal contracted diameter of said ring inner surface being slightly less than the diameter of said valve member outer surface whereby said ring firmly receives said valve member, ring expanding means defined on said valve member initially engaging and expanding said ring to said expanded diameter upon engagement by said valve member, and ring mounting means mounting said ring upon said head limiting axial movement of said ring and permitting radial contraction and expansion thereof.

4,296,676
CONTROL MECHANISM

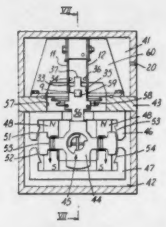
David K. Andrews, Cheltenham, and Michael W. Smart, Gloucester, both of England, assignors to Dowty Fuel Systems Limited, Cheltenham, England

Filed Dec. 11, 1979, Ser. No. 102,416

Claims priority, application United Kingdom, Dec. 15, 1978, 48787/78

Int. Cl.³ F15B *13/044*

U.S. Cl. 91—417 R **9 Claims**



1. A mechanism for controlling the position of a movable member comprising a valve having a closed position and an open position, a hydraulic displacement device secured for movement with the member and a hydraulic connection between the valve and the device such that for the valve-closed position the device and member are hydraulically locked against movement and for the valve-open position the member and device may move, the valve being formed by a pair of relatively-slidable valve components having co-operating flat surfaces, one of said components being slidably carried in and projecting outwardly from an aperture formed in a pivotally mounted arm and the other being fixed so that angular movement of the arm causes sliding movement of the one component over the fixed component, at least one of said components having at least one port in its flat surface closable by the other of said components in the valve-closed position, loading means housed within said arm and bearing on said one component to urge it in a direction outwardly of said arm and thereby hold its flat surface in sliding sealing engagement with the co-operating flat surface of said fixed component, a preloaded spring assembly comprising a pair of stops carried by said arm, a pair of leaf springs mounted to press oppositely with pre-load on said arm stops, and a pair of fixed stops adapted to contact the leaf springs at positions adjacent said arm stops, said leaf springs thereby acting between said components in a direction parallel to said co-operating flat surfaces so that the spring pre-load on its own may move said components to the valve-closed position, and a force motor which is capable, when energised, of exerting a force to move one said component relative to the other against the pre-load of the spring assembly towards the valve-open position.

4,296,677
TANDEM HYDRAULIC ACTUATOR

Jane Little, Long Beach, and Del F. Greene, Los Angeles, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 25, 1979, Ser. No. 51,815

Int. Cl.³ F15B *13/00*

U.S. Cl. 91—510 **10 Claims**

1. A fluid actuated cylinder comprising:

a housing having a cylindrical bore;

gland means dividing said cylindrical bore in said housing into a first chamber and a second chamber;

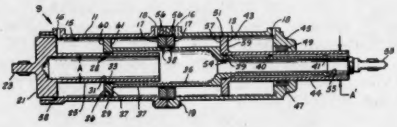
an end wall, having an internal tail rod with an area 'A' closing said second chamber of said housing;

a first piston for movement in said first chamber;

a second piston for movement in said second chamber;

rod means penetrating said gland means, operatively connecting said first piston to said second piston in tandem, said pistons are axially aligned and moveably disposed in their respective chambers to move in cooperation between extend and retract positions with one end of said rod means having a bore to accommodate said internal tail rod, an output rod connected to said first piston having an area 'A', extending from said first chamber;

a rod end wall closing said first chamber of said cylindrical bore in said housing and having a bore therein to accommodate said output rod extending from said first chamber; and



means for admitting pressure fluid against a first pressure surface on one side of said first piston and second pressure surface on one side of said second piston while exhausting fluid acting on a third pressure surface on the opposing side of said first piston and fourth pressure surface on the opposing side of said second piston so as to move said pistons in either direction, alternatively, the first and fourth pressure surfaces being equally dimensioned and the second and third pressure surfaces being equally dimensioned, whereby to define a fluid actuated, tandem, linear actuator having redundant chambers and equal combined areas in both extend and retract positions.

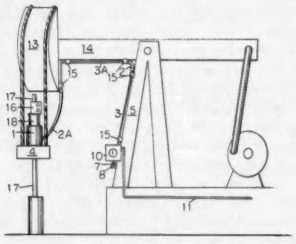
4,296,678
POLISH ROD JACK SYSTEM

Donald W. Felder, 1609 S. Vaden, Sherman, Tex. 75090

Filed Feb. 12, 1979, Ser. No. 11,692

Int. Cl.³ F01B *31/14;* **F15B** *15/24*

U.S. Cl. 92—13.1 **3 Claims**



1. In an oil well pumping unit including a walking beam pivotally mounted in a stationary support and supporting a horse head for vertical reciprocal movement, and a carrier bar suspended from the horse head reciprocally carrying a polish rod constituting the upper section of a sucker rod for operating a bottom hole pump, a hydraulic polish rod jack system comprising:

(a) a hydraulic ram mounted on the carrier bar,

(b) a ram piston mounted in said ram for vertical reciprocal movement,

(c) support means operatively connected to the polish rod for vertical reciprocal movement of the polish rod with said ram piston,

(d) a hydraulic conduit having first and second ends,

(e) a hydraulic quick-disconnect inlet fitting mounted on the stationary support and connected to said first end of said hydraulic conduit, said inlet fitting being adapted to be quickly connected to and disconnected from a pressurized source of hydraulic fluid,

(f) a hydraulic fliud quick-disconnect ram fitting on said ram, said ram fitting being adapted to be quickly connected to and disconnected from said second end of said hydraulic conduit,

(g) at least portions of said hydraulic conduit being flexible,

(h) clamp means holding portions of said conduit on the stationary support and on at least a portion of the horse head or the walking beam, so that said ram is in continuous fluid communication with said inlet fitting, even during the reciprocal movement of said ram.

4,296,679

CYLINDER WITH TWO-STAGE MOVEMENT, ESPECIALLY A WELDING CYLINDER

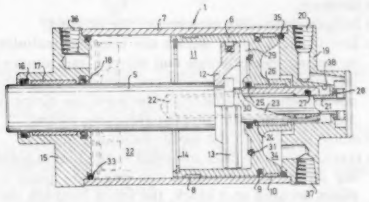
Karl-Erik H. Mattsson, Näsum, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Oct. 31, 1979, Ser. No. 90,055

Claims priority, application Sweden, Nov. 7, 1981, 7811488

Int. Cl.³ F01B *7/20*

U.S. Cl. 92—52 **5 Claims**



1. In a cylinder with two-stage movement, in which a first piston which seals against the inside of a housing is axially displaceable in the housing, and in which a second piston, arranged coaxially with the first piston, seals in an axial cavity in one end of the first piston, is axially displaceable in said cavity and carries a piston rod which slides sealingly through one housing end which faces the cavity in the first piston, and in which in the other housing end there is arranged a pressure medium inlet tube which extends through the first piston and into the piston rod, via which tube pressure medium can be brought into or out of a first chamber delimited by the first and the second pistons, and in which second and third chambers in the housing, on the sides of the first and second pistons that face away from each other, have pressure medium connections; the improvement comprising, on the side of the second piston facing away from the piston rod, a tubular, axially oriented guide member which is sealingly guided in the first piston and slides on the inlet tube and seals against the outside of the tube and extends through the first piston, the inlet tube, at its end facing away from the guide member, being movably mounted in said other housing end.

4,296,680

COUPLED SHELLS FOR VACUUM POWER SERVO BOOSTER

Ryuji Ohta, and Michio Kobayashi, both of Matsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,830

Claims priority, application Japan, Dec. 1, 1978, 53/148803; Dec. 1, 1978, 53/148804

Int. Cl.³ F01B *19/00;* **F16J** *3/02*

U.S. Cl. 92—98 D **6 Claims**

1. A vacuum power servo booster comprising:

a generally disc-shaped first shell,

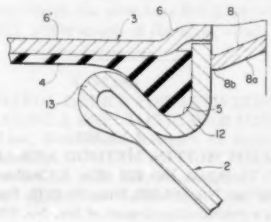
a generally cup-shaped second shell, said first and second shells defining an outer casing of said booster, and

a diaphragm secured between said first and second shells which divides the casing into two chambers,

an annular groove being integrally formed at a peripheral end portion of said first shell, said annular groove opening radially outwardly and said annular groove being defined by a first annular bent portion bulging radially inwardly from the peripheral end portion of said first shell and a second annular bent portion at an inward position of said first shell, said second annular bent portion being oriented approximately along the axial direction of said booster and bulging toward said second shell,

said second shell having a cylindrical portion adapted for insertion of said first shell therein, peripheral end portions of said diaphragm being interposed between said annular groove and said cylindrical portion, and

said second shell being provided with at least one axial recess in said cylindrical portion, said first shell being



provided with at least one radially outward protrusion adapted to be received in said recess, said first shell being further provided with a plurality of arcuate radial recesses at the outer peripheral surface thereof, and a plurality of locking portions arranged in an alternating manner between said recesses, said second shell being provided with locking means for engaging said locking portions, said locking means comprising radially inwardly extending arcuate locking pawls, said pawls being inclined toward the axis of said second shell so as to define guide surfaces, whereby peripheral portions of said diaphragm may smoothly pass over said guide surfaces in sliding contact therewith, without damage to said diaphragm.

4,296,681

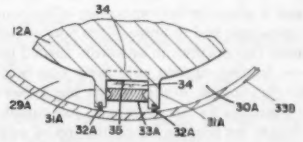
FLUID DRIVEN SERVOMECHANISM

Mark E. Rosheim, 1851 Chester #4, Royal Oak, Mich. 48073

Continuation-in-part of Ser. No. 884,903, Mar. 9, 1978, Pat. No. 4,194,437. This application Nov. 14, 1979, Ser. No. 94,045

Int. Cl.³ F01C *9/00*

U.S. Cl. 92—122 **12 Claims**



1. A fluid driven servomechanism comprising:

a support means;

a central drive member mounted on said support means in a manner which permits rotational motion about one axis and also about a second axis which is generally perpendicular to said one axis;

channel means disposed about said central drive member having a first channel partially circumscribing said one axis and a second channel partially circumscribing said second axis, each channel having walls and a bottom;

a first sealing means disposed along a substantial portion of said first channel so as to enclose said substantial portion of said channel, said first sealing means including fluid admission ports therein to permit fluid to enter said sub-

stantial portion of said first channel and further including second sealing means disposed along a substantial portion of said second channel so as to enclose said substantial portion of said second channel, said second sealing means including fluid admission ports to allow fluid to enter said substantial portion of said second channel; and

a first dividing means on said drive member and in said substantial portion of said first channel so as to divide the enclosed portion of said first channel and move said drive member about said one axis in response to a differential fluid pressure on opposite sides of said first dividing means and further including second dividing means similar to said first dividing means except located in said substantial portion of said second channel.

4,296,682

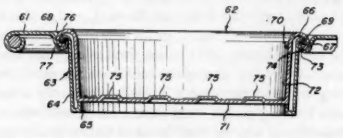
ENGLISH MUFFIN, METHOD AND APPARATUS

Jerome B. Thompson, Box 231 - Rte. 3, Cumberland, Md. 21502

Division of Ser. No. 964,509, Nov. 29, 1978, Pat. No. 4,216,241, which is a continuation-in-part of Ser. No. 843,498, Oct. 19, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,212

Int. Cl.[3] **A47J** *37/01*

U.S. Cl. 99—426 **5 Claims**



1. Apparatus for the baking of an English muffin in a conventional bun oven comprising a baking pan, a plurality of spaced cup units positioned in said pan, each of said cup units comprising an outer cup portion which will be in direct engagement with the oven heat and an inner cup portion positioned within said outer cup portion in inwardly spaced relationship therewith forming a dead air space between the sidewalls of each inner cup portion and each outer cup portion, means associated between each of said inner and outer cup portions adjacent the respective bottom ends of each to close the dead air space formed between the respective sidewalls of each and to place the bottom surface of each inner cup portion in an open state and to position the bottom surface of each of said inner cup portions in upwardly spaced relationship from an oven heating surface, said inner cup portion adapted to receive the English muffin dough piece therein and will be baked indirectly by the oven heat, and complementary cover plate means for positioning on the top of said baking pan to cover same, said cover means having a plurality of spaced areas having pattern-creating openings therein, one of each of said areas being in vertically spaced registry with one of said cup units, means for retaining the cover plate means and the baking means in tight engagement with one another so that said cover means will remain in contact with the baking pan throughout the baking operation and thereby forming on the surface of the English muffin a pattern effect corresponding to the perforations in said cover, said cover means being perforated to an extent such that a considerable portion of the cover means will be open, thus exposing a considerable area of the dough pieces to the direct heat of the baking oven, but the size and configuration of the perforations in the cover means are such that the dough will not rise or extrude through the openings to a point above the top surface of the cover means.

4,296,683

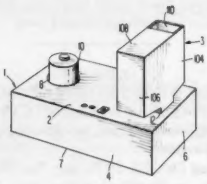
CAN CRUSHER

Albert F. Lidik, 105 Cherry St., and Randall E. Talley, III, 2910 Johnson St., both of Kissimmee, Fla. 32741

Filed Jul. 6, 1979, Ser. No. 55,205

Int. Cl.[3] **B30B** *9/32*

U.S. Cl. 100—53 **8 Claims**



1. A can crusher comprising:

a housing;

a hopper removably attached to the housing;

a first frame secured within the housing, including motor mounting means at one end thereof, ram support mounting means at the opposite end, and sprocket wheels supporting means on the frame between the motor mounting means and the ram support mounting means;

a motor secured to the motor mounting means;

a ram support pivotally mounted to the ram support mounting means comprising, a can engaging plate, a pair of plates secured to a block, the space between the ends of said pair of plates and said block define guide means, said pair of plates and said block secured to the can engaging plate, an aperture extending through the pair of plates and the block, and means secured in said aperture for rotatably supporting the ram support to the ram support mounting means;

a sprocket wheel rotatably supported on the sprocket wheel supporting means, said sprocket wheel having a hub integrally secured thereto, a crank pin block secured to said hub and rotatable therewith, said crank pin block having an aperture therein;

means for connecting the sprocket wheel and the motor whereby the sprocket wheel turns upon actuation of the motor;

a ram comprising a pair of horizontally spaced apart guide rails for reciprocating in said guide means, a can engaging plate secured to one end of the guide rails, a can cradle secured between the guide rails for supporting a can between the can engaging plate secured to the guide rails and the can engaging plate of the ram support, means for connecting the opposite ends of the guide rails to the crank pin block of the sprocket wheel hub so that as the sprocket wheel turns, the guide rails pivot with the ram support and reciprocate in the guide means whereby the can engaging plate of the guide rails advances toward the can engaging plate of the ram support crushing a can supported between said can engaging plates;

a second frame having means for securing one end thereof to the motor, and hopper supporting means at the opposite ends of the frame whereby the hopper is removably attached thereto, ram support plate mounted on the frame and means for securing the ram support plate, the ram support and the first frame together;

a switch mounted on the inside of the housing;

a switch arm extending from the switch into the housing a distance sufficient to contact the crank pin during rotation thereof, said switch arm inoperable to activate the switch during counterclockwise revolution of the crank pin and operable to activate the switch to stop the motor during clockwise rotation of the crank pin; and

an indicator operable in response to activation of the switch and stopping of the motor to indicate a jammed condition.

4,296,684

APPARATUS FOR STACKING FOLDED PRINTING PRODUCTS

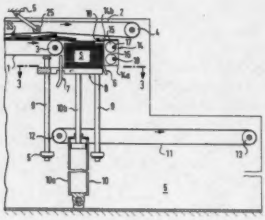
Jochen Wangermann, Appen, Fed. Rep. of Germany, assignor to Gruner & Jahr AG & Co., Itzehoe, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,924

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1979, 2902285

Int. Cl.[3] **B30B** *1/26;* **B65H** *29/38, 31/10*

U.S. Cl. 100—292 **8 Claims**



1. Apparatus for forming a vertical stack from folded printing products sequentially conveyed along a path with the folds in the leading position, said apparatus comprising

conveyor means (**1**, **2**) for defining the path and for conveying the products (P) sequentially therealong:

stop means (**6***a*, **6***b*, **6***c*) interposed in the path and toward which the products move

support means (**8**) adjacent said stop means for receiving the sequentially conveyed printing products in a vertical stack with the folds abutting said stop means:

pressing means (**14–20**) operatively associated with said stop means, said pressing means including at least three groups of presser members (**14**, **14'**) arranged in spaced relationship along said stop means and across said path; said presser member groups having drive means (**21**) for driving said presser members in an endless path, said path having a first upper position in which said presser members overlie the product stack, a second, lower position in which said presser members contact and press the stack on the support means, and having a portion in which said presser members have a component of motion, when in contact with the stack, drawing the product toward the stop means; the movements of said presser member groups being phase shifted with respect to each other such that one group returns from the lower position to the upper position when a second group overlies the product stack and a third group presses the stack: and

control means coupled to said conveyor means and drive means for synchronizing the supply of the printing products with the operation of said pressing means.

4,296,685

WARHEAD WITH SLAVE MISSILES DISPOSED IN A FIRING TUBE

Rudolf Romer, Kaarst, and Hans-Egon Schepp, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

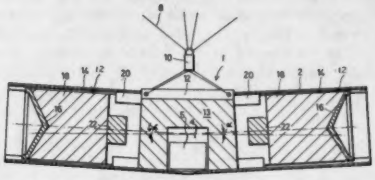
Filed Sep. 4, 1979, Ser. No. 72,434

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838347

Int. Cl.[3] **F42B** *25/02*

U.S. Cl. 102—387 **6 Claims**

1. In a warhead adapted to be disposed with a plurality of similar warheads axially in a load-carrying missile for ejection therefrom behind the other, the warhead carrying slave missiles disposed in firing tubes, the warhead having a parachute connected thereto to cause the directional, braked descent thereof in the target area, the slave missiles having proximity fuses causing their firing, the improvement wherein the warhead comprises a firing tube which is open at both ends and in which two slave missiles are disposed with a common propel-



lant charge between them, the parachute being secured to the firing tube centrally of the length of the firing tube.

4,296,686

REMOTE CONTROL DEVICE FOR ACTIVATING OR INACTIVATING A PNEUMATIC WAR MINE

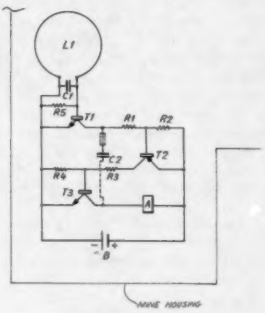
Joseph Marer, Lyss, Switzerland, assignor to Redon Trust, Schaan, Liechtenstein

Filed Jul. 25, 1979, Ser. No. 60,333

Claims priority, application Switzerland, Jul. 27, 1978, 8072/78

Int. Cl.[3] **F42C** *15/14*

U.S. Cl. 102—427 **2 Claims**



1. In a pneumatic war mine, a remote control device for activating and deactivating the mine, comprising

an electromagnetic relay operative for arming and disarming the mine;

a self-contained power supply;

a receiver circuit operative for receiving a transmitted control signal; and

an electric control circuit connected with said relay, power supply and receiver circuit, said control circuit being normally passive and beginning to draw power from said power supply only upon being triggered by receipt of a control signal at said receiver circuit.

4,296,687

SEGMENTED SABOT PROJECTILE

Harold E. Garrett, Santa Ana, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

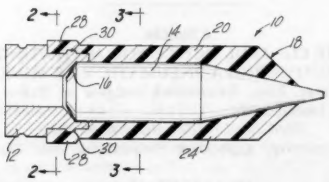
Filed Jul. 16, 1979, Ser. No. 57,778

Int. Cl.[3] **F42B** *13/16*

U.S. Cl. 102—518 **1 Claim**

1. A spin-stabilized discarding sabot projectile comprising a base, a core seated on the base, a multi-piece sabot encircling the core and the forward section of the base; said sabot comprising a first set of plastic segments evenly spaced around the core circumference, a second set of plastic segments occupying

circumferential spaces between adjacent ones of the first segments, and a plastic spinner band located at the rear end of the sabot to project radially outwardly beyond the sabot side surface, said band being integrally formed with the second set of plastic segments to define a one piece molding; said plastic band having a relatively thin radial dimension corresponding to the rifling thickness in a gun barrel whereby the band is severed by the rifling lands in the gun barrel as the projectile is fired out of the barrel; the plastic band being arranged in surrounding relation to the first plastic segments whereby the band constitutes a mechanism for retaining the plastic segments on the core, such that severing of the band enables the segments to be centrifugally separated from the core as the projectile exits from the gun barrel; each sabot segment having a circumferentially projecting rib **(34)** in one of its side edges, and a circumferentially projecting slot **(32)** in its other side



edge, the ribs and slots extending forwardly from the aforementioned base to the front end of the sabot, the ribs and slots on adjacent segments being interlocked together only while the projectile is within the gun barrel; the sabot segments having cylindrical outer surfaces cooperatively defining a cylindrical sabot outer surface, said segments occupying the entire circumferential space around the core without any intervening void spaces; one set of plastic segments being formed as a one piece molding using the base and core as a mold surface, the other set of plastic segments being formed by material molded into the circumferential spaces defined by said one segments, adjacent ones of the segments having non-adherent engagement with each other; the ogive portion of the core extending forwardly beyond the sabot segments so that adjacent segments are interconnected solely by the aforementioned plastic band and interlocked rib-slot connections.

4,296,688

ELECTRIC CIRCUIT FOR FIRING A DETONATOR

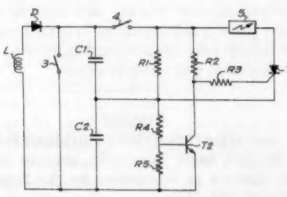
Robert G. Orlandi, Prilly, Switzerland, assignor to S.A. PRB Societe Anonyme, Brussels, Belgium

Filed Sep. 4, 1979, Ser. No. 72,100

Claims priority, application Switzerland, Sep. 5, 1978, 9329/78

Int. Cl.[3] **F42C** *11/06*

U.S. Cl. 102—218 **3 Claims**



1. Electric circuit for firing a detonator for a projectile, comprising a generator for charging a first condenser and a second condenser connected in series, the aforesaid first condenser being connected in series with a contactor, a primer and a semi-conductor component with a controlled conductibility, and means for stabilizing the voltage of one of the aforesaid condensers and for preventing the firing of the primer during a predetermined time, in which the aforesaid means comprise a first voltage divider connected in parallel with the series connection of the aforesaid first condenser and second condenser and aforesaid contactor, the control electrode of the aforesaid semi-conductor component being connected with the intermediate point of the aforesaid first voltage divider comprising a resistor and a transistor, the base of which is connected with the intermediate point of a second voltage divider connected in parallel with the aforesaid second condenser, the capacity of which is many times greater than the capacity of the first condenser.

4,296,689

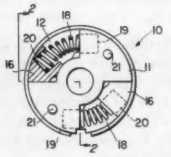
ROTARY LOCKING MECHANISM

Thomas K. C. Hardesty, Ednor, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 25, 1979, Ser. No. 60,557

Int. Cl.[3] **F42C** *15/20*

U.S. Cl. 102—260 **6 Claims**



1. A rotary-acting, safing and arming, ball-lock mechanism for releasably locking an arming shaft of a weapon against axial movement, said arming shaft having an engageable surface, comprising:

a base member having a central longitudinal aperture therein for receiving the arming shaft;

a rotor mounted for limited rotary movement on said base member;

a plurality of radial apertures formed in said base member and communicating with said central longitudinal aperture;

a plurality of balls disposed in said radial apertures;

a plurality of cam surfaces formed on said rotor for moving said balls partially through said radial apertures into said central aperture and into engagement with the arming shaft engageable surface to lock the shaft against movement when said rotor is moved to a safe position;

means for locking said base member and said rotor in the safe position; and

a pair of compression springs interposed between said base member and said rotor for moving said rotor to an arming position when said locking means is released whereby said balls are free to disengage the arming shaft engageable surface, release the arming shaft and permit axial movement of the arming shaft to the arming position to arm the weapon.

4,296,690

HANGER FOR TRACK-TYPE SUSPENDED RAILWAY

Rudolf Baltensperger, Alte Keiserstuhlstr. 157, CH 8181 Höri, and Hans B. Pfister, Frohhaldenstr. 20, CH 8180 Bülach, both of Switzerland

Filed Nov. 1, 1978, Ser. No. 956,654

Claims priority, application Switzerland, Nov. 11, 1977, 13779/77

Int. Cl.[3] **E01B** *3/00*

U.S. Cl. 104—91 **9 Claims**

1. In a suspended railway having at least one suspension cable lying generally in a vertical plane and an at least gener-

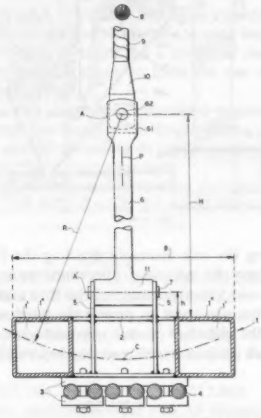
ally horizontally elongated track formed by a pair of generally parallel hollow beams having upper sides constituting an upper surface and a predetermined transverse horizontal width and lying generally in said plane below said cable, a hanger comprising:

an upper part secured to said suspension cable;

a lower part secured to said track below said upper part;

a rigid T-shaped intermediate part between said upper and lower parts;

an upper pivot interconnecting said upper and intermediate



parts and defining therebetween a generally horizontal upper pivot axis extending generally in said plane and spaced at said hanger above said upper surface of said track by a vertical distance at least equal to said transverse width; and

a lower pivot interconnecting said intermediate and lower parts and defining therebetween a lower pivot axis extending generally perpendicular to said plane and closely juxtaposed with said upper surface at said hanger, said pivot axes being relatively fixed and immovable relative to each other.

4,296,691

APPARATUS FOR USE ON VEHICLE TRANSPORTERS

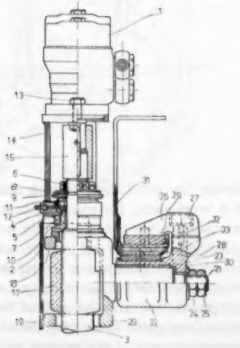
Robert Lohr, 14, rue du 14 Juillet, 67980 Hangenbieten, France

Filed Sep. 11, 1978, Ser. No. 941,246

Claims priority, application France, Sep. 16, 1977, 77 28555

Int. Cl.³ B60P *3/06;* **B61D** *3/06*

U.S. Cl. 105—370 **12 Claims**



1. In an apparatus for vertically moving an upper platform of vehicle transporter trailer comprising a lower platform disposed on a chassis and an upper platform supported at a distance from the lower platform for movement toward and away from the lower platform, front and rear vertical support posts secured to the lower platform for supporting front and rear portions of the upper platform, vertical screws housed in at least one of said front and rear posts, drive means for rotating the screws, and a nut and guide assembly on each rotatable screw adapted for vertical displacement along the screw in response to rotation thereof by the drive means, said assembly supportably and drivably engaging the upper platform, the improvement wherein the nut and guide assembly comprises a screw driven nut vertically displaced upon rotation of the screw and a separate support fork disconnected from and resting on the nut for vertical movement therewith, said support fork being transversely moveable relative to the drive nut to permit guiding of the upper platform while only imposing axial forces on the screw and the drive nut.

4,296,692

RAILWAY CAR CEILING PANEL

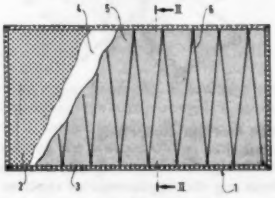
Marc Roux, La Rochelle, France, assignor to Alsthom-Atlantique, Paris, France

Filed Sep. 6, 1979, Ser. No. 73,037

Claims priority, application France, Sep. 13, 1978, 78 26247

Int. Cl.³ B60R *13/08;* **B61D** *17/18;* **E04B** *13/08*

U.S. Cl. 105—397 **4 Claims**



1. A ceiling component, in particular for rail vehicles, said component being formed by a curved panel and having a support which supports a layer of sound-proofing and heat insulating material, the improvement wherein the support is made in one piece and is constituted by a metal sheet having double edge portions forming a peripheral flange spaced slightly inwardly projecting from one surface of said panel, said double edge portions alone providing the rigidity necessary for the panel and wherein each edge portion is bent twice, firstly completely inwards on itself and, secondly, in a plane which is substantially perpendicular to the first bend and which alone forms the peripheral flange.

4,296,693

BEACH UMBRELLA SUPPORT

Richard W. Archer, 4/66 Beresford Rd., Rose Bay, New South Wales, 2029, Australia

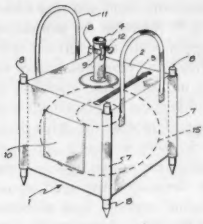
Filed Feb. 8, 1979, Ser. No. 10,407

Int. Cl.³ A47B *41/04, 35/00*

U.S. Cl. 108—28 **3 Claims**

1. A support for the shaft of a beach umbrella comprising a flat bottom collapsible container adapted to receive solid or liquid material, said container having a top part with a filler opening therein, a tubular member extending centrally from the top part of said container and adapted to receive the shaft of said beach umbrella, means to clamp said beach umbrella

shaft to said tubular member, a central opening in the bottom of said container large enough to allow said beach umbrella



shaft to pass therethrough and a doughnut shaped water-tight insert in said container.

4,296,694

GUITARIST'S FOOT-REST

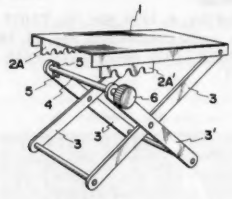
Itaru Kobayashi, 1-15-2, Motomachi, Kiyose City, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,569

Claims priority, application Japan, Dec. 26, 1978, 53/159122

Int. Cl.[3] **A47C** *9/12*

U.S. Cl. 108—116 **2 Claims**



1. Guitarist's foot-rest comprising;
a tread-board,
a pair of cross legs for supporting said tread-board,
a rod connecting the upper ends of the free legs having single wire staple or double wire staples, and
a pair of parallel height regulating plates attached below the tread-board, each of said height regulating plates being provided with a number of recesses for receiving the connecting rod and recesses for receiving single or double wire staples.

4,296,695

SEEDING DEVICE WITH AIR DISTRIBUTION SYSTEM

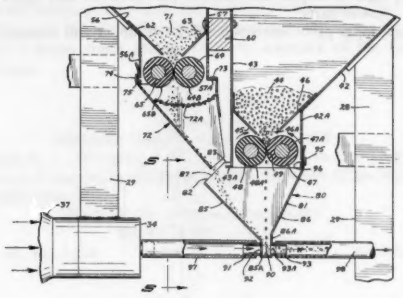
Sherman H. Quanbeck, Aneta, N. Dak., assignor to Wil-Rich, Inc., Wahpeton, N. Dak.

Continuation of Ser. No. 892,985, Apr. 3, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,250

Int. Cl.[3] **A01C** *7/20, 7/06, 15/04*

U.S. Cl. 111—34 **20 Claims**

1. In a pneumatic distributor arrangement for distributing particulate materials from a storage tank and having a pair of elastomeric rollers having a length extending across the storage tank for metering discrete particles from said storage tank in a substantially continuous line extending along the length of said metering rollers, the rollers being substantially contiguous along the length thereof, the improvement comprising a plurality of individual cups positioned below said metering rollers to receive material being dispensed, said cups being individually removably attached to said storage tank and positioned therebelow, said cups having fore and aft walls and side walls joining said fore and aft walls to form an open topped cup, the fore and aft walls having lower portions, a bottom wall joining the lower portions and extending therebetween to define a chamber adjacent the bottom of each of said cups, an inlet orifice defined in one of the lower portions and an outlet opening of larger diameter than the inlet orifice substantially directly axially aligned with said inlet orifice and defined in the other lower portion, each side wall having an upper edge substantially contiguous with the upper edges of the side walls of ajdacent cups, the upper edges of the side walls of adjacent cups extending transverse to the length of said metering rollers



and forming the sole means of dividing the line of dispensed material from the metering rollers into separated portions in each cup, said lower portions of the fore and aft walls being spaced a distance apart to permit the particulate material to drop into the chamber of each cup and into the flow of fluid passing from each inlet orifice to the respective outlet opening.

4,296,696

DEVICE FOR PRODUCING SEWING SEAM PATTERNS OF STITCH GROUPS

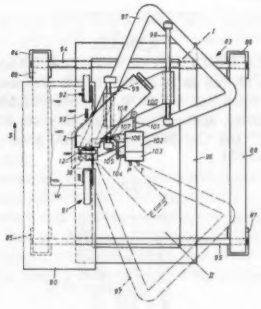
Hermann Taddicken, Schwäbisch Gmünd-Unterbettringen, and Wolfgang Sachs, Mögglingen, both of Fed. Rep. of Germany, assignors to Eisele Apparate-und Gerätebau GmbH, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,777

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935763

Int. Cl.[3] **D05B** *3/06*

U.S. Cl. 112—70 **13 Claims**



1. A device for producing sewing seam patterns of stitch groups in a workpiece, for example buttonholes, including a holding mechanism for displacing the work intermittently to perform individual sewing operations, and a sewing machine equipped with a work clamping mechanism which is displaceable relative to a needle bar performing a swinging motion, and which engages the work in the area of the seam pattern to be sewn, comprising, guide means connected to the sewing machine for displacement of the sewing machine parallel to the direction of displacement of the clamping mechanism, and a drive mechanism connected to the guide means and controlled

by motion of the clamping mechanism through which cyclic motions in conformity with stitch formation are imparted to the sewing machine along a distance corresponding to the length of a seam pattern to be formed, which motions are opposite in direction to those of the clamping mechanism.

12. A method of producing sewing seam patterns as stitch groups comprising:

intermittently displacing a workpiece to receive seam patterns in a workpiece feed direction;

clamping the workpiece in an area thereof to receive a seam pattern;

moving the clamped workpiece area from an initial position past a sewing needle and looper of a sewing machine, in a first seam forming direction for a length of one side of a seam pattern to be formed, to form the one side of the seam pattern;

moving the sewing machine in a direction opposite the first seam forming direction for the length of the one side to return the workpiece area to its initial position;

unclamping the workpiece area; and

intermittently displacing the workpiece by a distance equal to a spacing between adjacent seam patterns to be formed.

4,296,697

SEWING MACHINE WITH A WORK HOLDER FOR WRAPPING BUTTON SHANKS

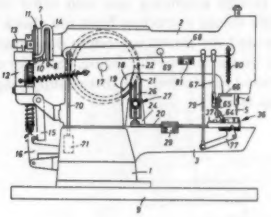
Karl Barth; Ernst Albrecht, both of Hochspeyer, and Horst Stahlschmitt, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

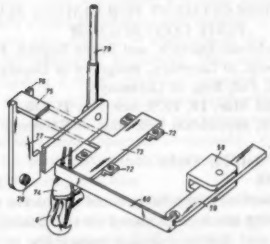
Filed Dec. 3, 1980, Ser. No. 212,563

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 7934154

Int. Cl.³ D05B *3/16, 53/00*

U.S. Cl. 112—109 **8 Claims**





1. A device for wrapping button shanks connecting a workpiece to a button, with thread in a sewing machine comprising, a first holding element against which the workpiece can bear, a second holding element against which the button can bear spaced from the first holding element with the shank extending between the first and second holding elements, and adjustment means connected to the first and second holding elements for adjusting the spacing therebetween.

4,296,698

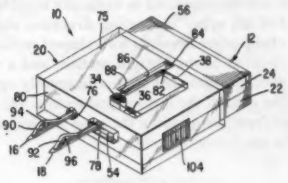
BUTTON ATTACHING HAND TOOL WITH BUTTON STORAGE COMPARTMENT

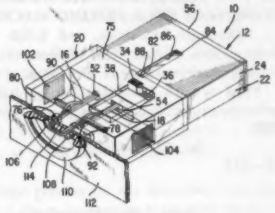
Donald R. Davidson, Berkeley Heights, and Walter H. W. Marsh, Fanwood, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 14, 1980, Ser. No. 167,984

Int. Cl.³ D05B *3/14*

U.S. Cl. 112—110 **10 Claims**





1. A button attaching hand tool including a box-like structure with a button storage compartment, a needle affixed in said structure, a second needle movable in said structure, means for adjusting the position of the second needle in said structure relative to the fixed needle to establish a spacing between the needles corresponding to the spacing between the holes of a button to be attached to a piece of material with said tool, and a slidable shroud on the box-like structure for use in removing the material and button from the tool, the shroud being slidable between one position wherein the shroud shields an operator from injury by the needles and another position wherein the needles are exposed for button attaching use.

4,296,699

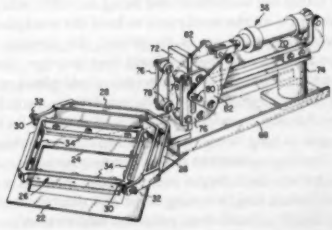
FABRIC CLAMP

Artin G. Vartoukian, Roselle Park, N.J., assignor to The Singer Company, Stamford, Conn.

Division of Ser. No. 952,901, Oct. 19, 1978, Pat. No. 4,186,673. This application Jun. 27, 1979, Ser. No. 53,144

Int. Cl.³ D05B *21/00;* D05C *9/04;* G05B *19/32*

U.S. Cl. 112—121.15 **4 Claims**



1. A fabric clamp for supporting and guiding fabric to be

sewn in cooperative disposition with respect to the needle of a sewing machine, for use with a variable translation fabric feeding mechanism, said clamp comprising:

a lower supporting structure;

an upper supporting structure rigidly connected to the lower supporting structure;

a lower, flat plate extending from the lower supporting structure and having a cutout in its interior portion of a size and shape slightly larger than the excursion of said variable translation fabric feeding mechanism;

an upright section connected in vertically slidable fashion to one end of the upper supporting structure; and

an upper clamp plate having a fork-shaped section which is fixedly secured to the upright section, and a rigid, open frame pivotably mounted at two diagonally opposed corners to the ends of the fork-shaped section, the opening in said open frame being about the same size and shape as the cutout in the lower, flat plate.

4,296,700

DEVICE FOR THE AUTOMATIC GUIDING OF A WORKPIECE ON A SEWING MACHINE

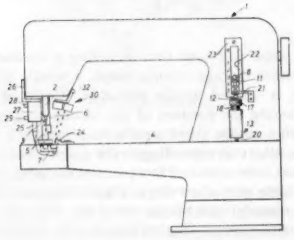
Fritz Jehle, Enkenbach-Alsenborn, and Erich Willenbacher, Kaiserslautern, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 28, 1980, Ser. No. 144,039

Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917950

Int. Cl.³ D05B *35/10*

U.S. Cl. 112—153 **4 Claims**



1. A device for the automatic guiding of a workpiece on a sewing machine so as to produce a curved edge parallel seam and in a sewing machine which includes a reciprocating needle and a presser foot which are engageable with the workpiece and a feed member which is engageable with the workpiece as it moves through a substantially rectangular feed path to move it relative to the needle and, including a guide rule disposed in spaced relationship to the needle for guiding the edge of the workpiece and a scanner scanning the workpiece edge for sensing its position, the improvement comprising a plunger mounted above the workpiece and being movable into and out of engagement with the workpiece to hold the workpiece upon engagement therewith so as to permit the turning thereof during the feeding movement of said feed member, first drive means connected to said plunger to move said plunger toward and away from engagement with the workpiece, a stitch length setting mechanism connected to said feed member including a stitch length setting lever which is movable to change the length of feeding movement of said feeding member, a second drive mechanism including a rod movable through a path to engage said stitch length setting lever and displace it to adjust a feeding length of said feed member, said first drive means being connected to said second drive means so as to operate said second drive means as a function of said first drive means.

4,296,701

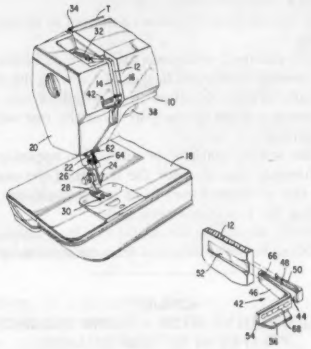
THREADING ARRANGEMENT FOR CHAINSTITCH SEWING ON A SEWING MACHINE

Robert H. Larsen, Middletown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 6, 1980, Ser. No. 204,420

Int. Cl.³ D05B *1/14*

U.S. Cl. 112—168 **9 Claims**



1. In a sewing machine which includes a partitioning wall in a bracket arm between thread receiving channels, and wherein needle thread extends down one of said channels, around the bottom edge of the partition wall and into the other channel, upwardly through a check spring to a movable thread pulling and thread supplying take-up lever, and downwardly from the take-up lever on the way to a sewing needle; a chainstitch thread guide attached to the partitioning wall and including a thread guiding trough extending into said other channel to receive the needle thread extending from the check spring to the take-up lever and the thread extending downwardly from the take-up lever on the way to the needle, the inner end of the trough being located to decrease the thread supplying capability of the take-up lever.

4,296,702

STORAGE COMPARTMENT FOR SEWING MACHINE FOOT CONTROLLER

Willi Meier, Karlsruhe-Durlach, and Bernd Rojahn, Herxheim, both of Fed. Rep. of Germany, assignors to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,834

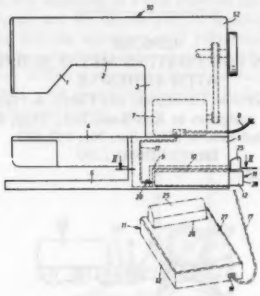
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 7808896[U]

Int. Cl.³ D05B *69/10, 75/00*

U.S. Cl. 112—258 **10 Claims**

1. A sewing machine comprising, a casing, a drive motor for driving said sewing machine mounted on said casing, a recess defined within said casing opening outwardly to one side thereof, a foot control member for said motor having a housing portion removably positionable in said recess and a control portion for regulating the speed of said motor in said housing portion, a cable fixedly attached to said casing and electrically interconnected with said control portion and said motor through said housing portion, a winding reel rotatably mounted in said housing portion about said control portion and having a drum portion around which at least part of said cable is wound, said winding reel rotatable with respect to said

housing portion for winding and unwinding said cable to permit movement to said control member out said recess, and



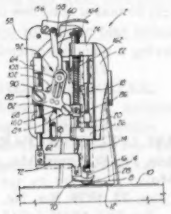
spring means mounted on said drum portion for biasing said winding reel in a direction to rewind said cable.

4,296,703

SEWING MACHINE CONVERSION APPARATUS

Elmer R. Thompson, 2408 47th St., Lubbock, Tex. 79412

Filed Oct. 3, 1979, Ser. No. 81,345
Int. Cl.³ D05D *27/00, 27/20*
U.S. Cl. 112—310 **16 Claims**



1. Apparatus for converting a sewing machine capable of sewing lightweight material to one capable of sewing heavier material and also capable of maintaining the material's seam connectible designs in alignment, the unconverted sewing machine having a main crankshaft coupled to a primary lift shaft and to a primary feed shaft and further having a feed dog for feeding a workpiece across a workpiece supporting surface of the machine, said apparatus comprising:

means for pivotally connecting a needle bar and a feed foot to said sewing machine;

means, responsive to actuation of said primary feed shaft, for oscillatably pivoting said connecting means in a feed direction and a reverse feed direction;

means, responsive to actuation of said primary lift shaft, for clamping said workpiece against said workpiece supporting surface during said reverse-feed direction pivotation; and

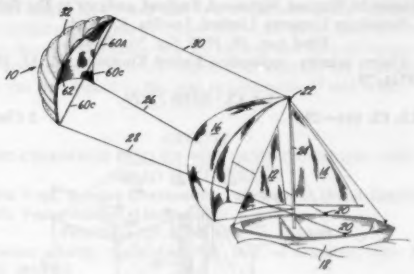
means, responsive to actuation of said primary lift shaft, for lowering and raising said feed dog at the substantial extreme of said feed direction pivotation and at the substantial extreme of said reverse-feed direction pivotation, respectively.

4,296,704

ANTI-GRAVITY SPINNAKER

John G. Bridge, P.O. Box 503, Poughkeepsie, N.Y. 12601

Filed May 7, 1979, Ser. No. 36,802
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—103 **8 Claims**



1. A spinnaker large enough to aid a sailboat when sailing with the wind behind the boat, comprising:

a piece of flexible sail fabric having a top end, a bottom end and at least two sides, an interior surface and an exterior surface;

a plurality of tubular shaped inflatable bags of variable widths attached to the exterior surface of the fabric and containing a lighter-than-air gas;

stabilizing lines extending from the corners of the interior surface of the fabric said lines joined above the surface of the fabric at about the mid-point of the interior surface; and

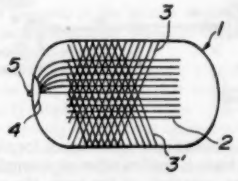
means at three pointss on the spinnaker for attaching riggings from the spinnaker to both sides of the hull of the boat and to the top of the mast.

4,296,705

PNEUMATIC MARINE FENDER

Hisanari Uruta, Tokyo; Kaneaki Takahashi, Yokohama; Hirotsugu Masuda, Yokohama, and Tomoyuki Kurata, Yokohama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

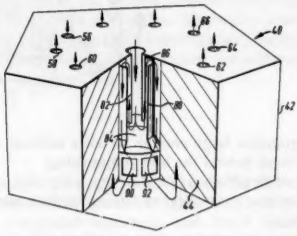
Filed Feb. 28, 1979, Ser. No. 16,705
Claims priority, application Japan, Mar. 3, 1978, 53/23601
Int. Cl.³ B63B *59/02*
U.S. Cl. 114—219 **2 Claims**



1. A pneumatic marine fender composed of cylindrical barrel serving as a shock receiving face, comprising a hollow cylindrical shell formed of rubber or rubber-like elastic material and a composite inner reinforcement composed of two kinds of cord layers comprising an axially extending cord layer substantially covering the end surface of said cylindrical shell and at least two circumferentially extending cord layers whose cords are slightly inclined at an angle of the order of smaller than 30°, preferably 19° with respect to the circumferential line of the cylindrical barrel and symmetrical arranged with respect to the circumferential line of the cylindrical shell in reverse directions and helically wound around the cylindrical

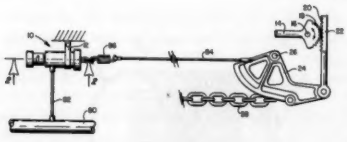
shell, the inclined cut ends of said circumferentially extending cords aligned at one end of said cylindrical barrel.

4,296,706
ANCHOR
Eugene M. Hughes, Richmond, England, assignor to The British Petroleum Company Limited, London, England
Filed Aug. 28, 1979, Ser. No. 70,442
Claims priority, application United Kingdom, Jul. 13, 1978, 29741/78
Int. Cl.[3] B63B 21/24
U.S. Cl. 114—294 5 Claims



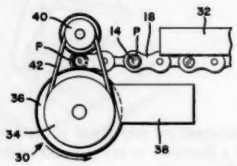
4. A gravity anchor comprising:
a set of bouyancy tanks;
a container affixed to said tanks and having an interior volume for the reception of liquid ballast;
a conduit extending vertically to the interior of said container from an opening in an upper surface of said container; and
a wall upstanding from a floor of said container and surrounding an opening at the bottom of said conduit to serve as a weir for the distribution of ballast conducted into said container via said conduit.

4,296,707
RAILROAD CAR HAND BRAKE SIGNAL DEVICE
Leroy P. Kennedy, Mahwah, N.J., assignor to Abex Corporation, New York, N.Y.
Filed Feb. 13, 1980, Ser. No. 120,964
Int. Cl.[3] B61D 49/00; G01L 19/12
U.S. Cl. 116—58 A 2 Claims



1. A railroad car hand brake signal device for alerting a train crew that a hand brake is applied when air is supplied to a train brake pipe during operation of the train, the signal device comprising a housing and means for mounting the housing on a railroad car; characterized by a port formed laterally in a wall in the housing which is connected to the railroad car brake pipe, blocking means for blocking the port movable within the housing between a first position which blocks the port and a second position which opens the port to bleed air in the brake pipe into the housing, an air operated whistle formed in the housing, a passage formed in means connecting the whistle to the housing which connects the port with the whistle, the passage being sized to cause significant bleed off of air in the brake pipe when the port is open to signal the train crew, and means for connecting the blocking means with a movable element of the hand brake wherein when the hand brake is applied the element moves in one direction to thereby move the blocking means to the second position to uncover the port to cause air to bleed from the brake pipe and the whistle to operate.

4,296,708
APPARATUS FOR COATING METAL SUBSTRATES WITH ADHESIVE
Kenneth L. Robertson, Covington, and Curtis A. Heslep, Piqua, both of Ohio, assignors to Ken-Koat, Inc., Troy, Ohio
Filed Feb. 1, 1980, Ser. No. 117,693
Int. Cl.[3] B05C 1/00
U.S. Cl. 118—233 3 Claims



1. Apparatus for uniformly coating a metal substrate with an adhesive comprising at least one coating station and at least one drying station, said coating station including a coating roll covered with an all natural fiber felt, means to rotate said coating roll, a reservoir means for supplying a solvent-based adhesive to said coating roll, and an idler roll adapted to be disposed on the opposite side of said metal substrate from said coating roll, and belt means connecting said idler roll to said coating roll for rotating said idler roll in the same direction as said coating roll and for pressing said metal substrate against said coating roll, said drying station including means to heat the air in said station, and means for conveying said metal substrate successively to said at least one coating station and at least one drying station said means for conveying comprising an endless chain having a mandrel extending outwardly from each link.

4,296,709
ANIMAL LITTER PREPARATION
Benjamin M. Schulein, Jr., St. Louis, Mo., assignor to Alfa-Pet, Inc., St. Louis, Mo.
Filed Jun. 22, 1979, Ser. No. 51,209
Int. Cl.[3] A01K 1/015
U.S. Cl. 119—1 6 Claims

1. An animal litter consisting essentially of a chlorophyll-containing agent from the class consisting of alfalfa, algae, broom grass and timothy grass, and a relatively high density cellulosic agent consisting of corncob grits, said chlorophyll-containing agent and said grits being physically intermixed in a dry, discrete state, said intermixture being free of chemical agents, compounds, and preparations, said grits constituting between approximately 50% to 70% by weight of the litter and said chlorophyll-containing agent constituting approximately 50% to 30% of the litter.

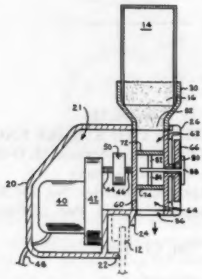
4,296,710
AUTOMATIC FEEDING APPARATUS
William M. Sillers, III, P.O. Box 227, Grant, Fla. 32949
Filed Apr. 8, 1980, Ser. No. 138,355
Int. Cl.[3] A01K 61/02
U.S. Cl. 119—51.11 11 Claims

1. An automatic feeding apparatus for periodically dispensing fish food into an aquarium, said apparatus comprising in combination:
a body member for being removably coupled to the aquarium;

a hopper carried by said body member for receiving a storage canister of fish food;

valve means movably coupled to said body member for periodically receiving in a first position the fish food from said hopper and for discharging in a second position the fish food into the aquarium, said valve means including,

a generally cylindrical drum dispenser which is rotatably carried within a circumferential section of said body member, with said drum dispenser including therein an open metering bore, and



a first piston movable within said bore so as to adjust the capacity of a first food receptacle defined by said metering bore, said first piston and said circumferential section of said body member;

actuator means for rotating said valve means between said first and said second positions; and

clutch means interposed between said actuator means and said valve means for allowing the operating position of said valve means to be continuously adjusted between said first and said second positions, whereby the exact discharge time of the fish food into the aquarium may be adjusted.

4,296,711

HEATING BOILER

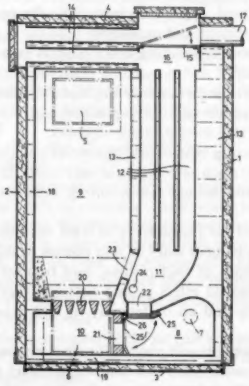
Erik A. Bilberg, Strängnäs, Sweden, assignor to EABVV Utvecklings Aktiebolag, Strängnäs, Sweden

Filed Feb. 15, 1980, Ser. No. 121,659

Claims priority, application Sweden, Apr. 10, 1979, 7903172

Int. Cl.³ F22B *31/04*

U.S. Cl. 122—22 **6 Claims**



1. In a heating boiler for combined firing with liquid fuel and/or solid fuel, comprising a liquid fuel combustion chamber, a solid fuel combustion chamber having a grate, at least one flue in communication with said chambers and in contact with water, and at least the walls of the solid fuel combustion chamber in contact with water, the improvement comprising a first connection between said liquid fuel combustion chamber and said flue, a second connection between said liquid fuel combustion chamber and said solid fuel combustion chamber, closure means for closing said first connection while opening said second connection to couple said combustion chambers in series through said grate, and for closing said second connection while opening said first connection, whereby the available fuels can be adapted to the heat requirements of said boiler.

4,296,712

TWO-CHAMBER BOILER FOR BURNER FIRING AND SOLID FUEL FIRING

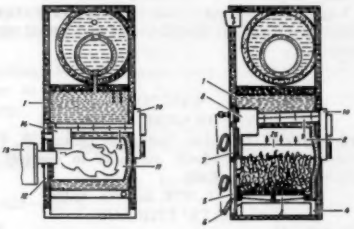
Alfred Vogt, Schaan, Liechtenstein, assignor to Hoval Interliz AG, Vaduz-Neugut, Liechtenstein

Filed Mar. 27, 1980, Ser. No. 134,613

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913205

Int. Cl.³ F22B *31/04*

U.S. Cl. 122—22 **6 Claims**



1. A two-chamber boiler comprising

a horizontal outer boiler body enclosing a common water region,

a burner chamber adapted for a burner firing system and a combustion chamber adapted for a solid fuel firing system being arranged laterally adjacent one another in said outer boiler body in the common water region,

two separate horizontal ancillary heating passages disposed in said water region, one of said passages respectively being disposed above said chambers respectively communicating therewith and leading to a flue gas collector of the boiler,

a fire grate disposed at the bottom of said boiler body and formed with air passage openings communicating with said combustion chamber,

said combustion chamber comprises a horizontally extending hollow body closed at a rear end and having an approximately elliptical cross-section with a vertical major diameter tapering downwards approximately conically to said fire grate, the cross-section of said hollow body below said fire grate transfering into an ash space of box form,

a first ancillary heating passage of rectangular cross-section arranged axially parallel to and above said combustion chamber in the boiler water region and communicating with a forward end of said combustion chamber, said first ancillary heating passage having a large cross-sectional width extending horizontally and said first ancillary heating passage having vertically directed ribbing of comb-type cross-section disposed inside said first ancillary heating passage,

said burner chamber comprises a horizontally extending round cylinder closed at a rear end, a longitudinal center line of said burner chamber being substantially at the level of a longitudinal center line of said combustion chamber,

a second ancillary heating passage of rectangular cross-section arranged axially parallel to and above said burner chamber in the boiler water region and communicating with a forward end of said burner chamber, said second ancillary heating passage having a larger cross-sectional width extending horizontally and said second ancillary heating passage having vertically directed ribbing of comb-type cross section disposed inside second ancillary heating passage,

said outer boiler body comprising a metal sheet shaped in one piece by rolling into a hollow body having a noncircular round-like cross-section comprising an upper curve portion, a lower curve portion and two lateral curve portions constituting four curve portions,

three transition curve portions having smaller radii of curvature than said four curve portions, said upper, said lower and said lateral curve portions merging into one another above said two chambers and below said burner chamber via said three transition curve portions, one of said lateral curve portions being laterally adjacent said combustion chamber and the other of said lateral curve portions being laterally adjacent said burner chamber,

said lower curve portion and said one of said lateral curve portions terminating at the ash space of said combustion chamber, and

the height of said other of said lateral curve portions being less than the height of said one of said lateral curve portions.

4,296,713

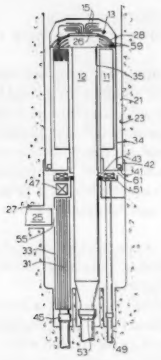
VAPOR GENERATOR

Edward S. Taylor, Del Mar, Calif., and George W. Hirschle, Wiesendangen, Switzerland, assignors to General Atomic Company, San Diego, Calif.

Filed Feb. 7, 1979, Ser. No. 10,090

Int. Cl.³ F22B *1/18*

U.S. Cl. 122—32 **7 Claims**



1. A vapor generator comprising, a high temperature section having a plurality of substantially straight tubes substantially parallel with each other forming an elongated tube bundle, a low temperature section having a plurality of substantially helical tubes forming an annular tube bundle positioned axially of said high temperature section, said tubes of said low temperature section being comprised of different metals having different coefficients of thermal expansion, said high temperature and low temperature sections being subject to thermal expansion of different amounts, means for directing a heating fluid through one of said tube bundles substantially parallel to the coaxes of said bundles and then through the other of said tube bundles in the opposite direction, said directing means including plate means extending transversely at one end of said vapor generator for turning the heating fluid through a substantially 180° turn, and a plurality of cross-over loops joining the tubes in said high temperature section to the tubes in said low temperature section, said cross-over loops each having portions of said different metals joined, respectively, to said section having the same metal, said cross-over loops each having a bimetal weld joining said portions of different metals, said bimetal welds being positioned on opposite sides of said plate means from said high temperature and low temperature sections to be out of the flow of the heating fluid.

4,296,714

DUAL PISTON TWO STROKE ENGINE

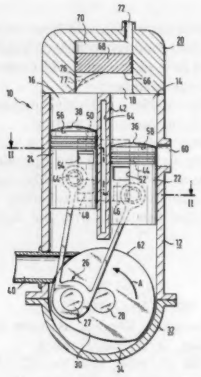
Bernhard Büchner, Ott-Heinrich-Strasse 25, D-8070 Ingolstadt-Unsernherrn, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,569

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923941

Int. Cl.³ F02B *25/12*

U.S. Cl. 123—53 B **12 Claims**



1. In a two stroke reciprocating engine, the combination of:

first and second cylinders;

first and second pistons reciprocably disposed in corresponding ones of said cylinders;

a crank chamber connecting said cylinders on corresponding ends thereof;

a combustion chamber connecting said cylinders on the ends thereof opposite said corresponding ends;

a crank rotatable in said crank chamber;

means connecting both of said pistons to said crank such that for one direction of rotation of said crank said first piston precedes said second piston during a reciprocating cycle thereof;

a transfer port for transferring at least combustion air from the crank chamber sides of said pistons to the combustion chamber sides of said pistons, said transfer port having first and second inlets in said first and second cylinders respectively and an outlet only in said second cylinder; and

control surfaces on said pistons for opening and closing said inlets and outlet such that said second inlet remains open later in said reciprocating cycle than said first inlet to thereby lengthen the period in said reciprocating cycle during which said transfer of at least combustion air may occur.

4,296,715
APPARATUS FOR EXTERNAL COOLING OF AN EXHAUST VALVE

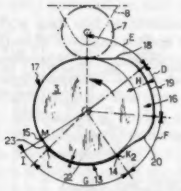
Remi Curtil, Montsoult, and Alain Devaux, Saint Mande, both of France, assignors to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France

Filed Feb. 2, 1979, Ser. No. 9,072

Claims priority, application France, Feb. 24, 1978, 78 05399

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.15 **5 Claims**



1. Apparatus for improving the external cooling of an exhaust valve of an internal combustion engine having a working piston in a cylinder, an intake valve for admitting air into said cylinder, an exhaust valve for exhausting combustion gases from said cylinder, and operating cams, each having a circular base profile and a main boss with a leading valve opening profile, an intermediate full open profile, and a trailing valve closing profile, for controlling the opening and closing of said intake valve and exhaust valve, respectively, such that the open periods of the intake valve and the exhaust valve normally mutually overlap by a predetermined value, wherein the improvement comprises:

said operating cam of the exhaust valve having a residual lift portion of substantially constant radius, the leading part of which merges smoothly and progressively with the valve closing profile of the main boss of said cam and the trailing part of which merges smoothly and progressively with the circular base profile of the cam, said residual lift portion extending through a circular angle corresponding to at least the major part of the intake valve opening period, and the radial height of the residual lift portion being such that the residual lift portion produces a small free flow section between the valve and its seat relative to the free flow section of the fully open valve.

4,296,716
INTERNAL COMBUSTION ENGINE FOR AN AUTOMOBILE WITH A DIVIDED OIL PAN

Peter Hofbauer; Michael Willmann, and Egon Wundrak, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 31, 1979, Ser. No. 44,050

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824415

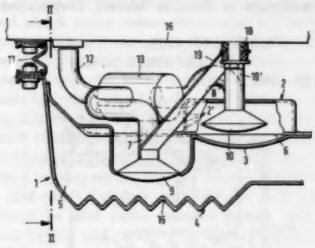
Int. Cl.³ F01M *11/06*

U.S. Cl. 123—195 C **12 Claims**

1. An internal combustion engine for an automobile with an oil pan divided into two chambers from which two lubricating oil quantities having different temperatures are obtained, the two chambers are in communication with each other and are equipped with suction lines, the bottom of a first one of said chambers being placed at a distance above the bottom of the oil pan, which is also the bottom of the second one of said chambers, characterized in that

at least the bottom region of the oil pan is exposed to the slip stream of the automobile and is designed in a heat-transmitting manner; and

a suction line from each chamber opens into a common delivery line by way of a thermostat valve, said thermostat valve forms a connection means wherein at low oil temperatures, at least predominantly, effects communication of the delivery line only with the first of the chambers and at oil temperatures above a preselected level, at least



predominantly, effects communication of the delivery line only with the second chamber instead of the first.

4,296,717
DRIVE ARRANGEMENT FOR AUXILIARY AGGREGATES OF AN INTERNAL COMBUSTION ENGINE

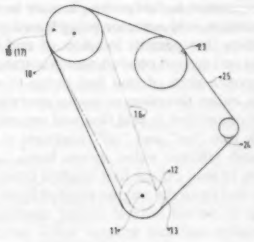
Walter Schlagmüller, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,553

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838343

Int. Cl.³ F02F *7/00*

U.S. Cl. 123—195 A **8 Claims**

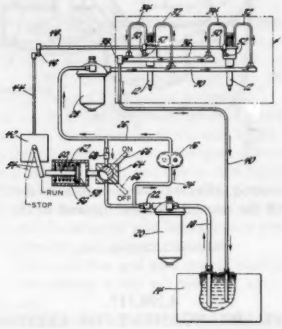


1. A drive arrangement of the character described, especially for motor vehicles, comprising a combustion engine having a drive shaft and a cam shaft driven by the drive shaft; a first pulley freely rotatably mounted on said drive shaft; centrifugal clutch means on said drive shaft for connecting said first pulley to said drive shaft when the latter rotates up to a predetermined speed and for disconnecting the drive of said first pulley by said drive shaft when the latter rotates above said predetermined speed; an intermediate pulley having a free wheel coupling driven at least indirectly by said cam shaft; a belt connecting said first pulley with said intermediate pulley; a plurality of auxiliary aggregates each having a shaft and a pulley fixedly mounted thereon, said first pulley, said intermediate pulley and the pulleys of said auxiliary aggregates being located in one plane and said belt connecting said first pulley to said intermediate pulley extending also about the pulleys of said auxiliary aggregates, whereby during rotation of said drive shaft up to said predetermined speed said auxiliary aggregates are driven by said first pulley and when said drive shaft rotates above said predetermined speed said auxiliary aggregates are driven by said intermediate pulley which is at least indirectly driven by said cam shaft.

4,296,718
DIESEL ENGINE SHUTDOWN CONTROL SYSTEM

Edward D. Baugh, and Mark B. Hoffman, both of Union Lake, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1979, Ser. No. 75,954
Int. Cl.³ F02M *63/02*
U.S. Cl. 123—198 D **4 Claims**



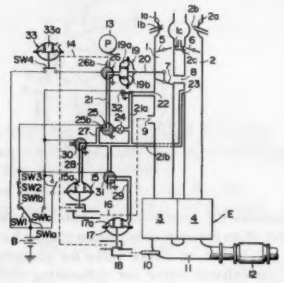
1. A diesel engine fuel supply and shutdown control system comprising fuel injection means to inject fuel into the engine combustion chambers, a control lever movable into "stop" and "run" positions to respectively prevent or permit fuel injection to the combustion chambers, an engine driven fuel pump capable of generating pressure in either direction of rotation and connected to supply fuel to the fuel injection means from a source of supply, a check valve to prevent reverse fuel flow from the fuel pump to the supply source and shutdown means including a pressure actuator operatively engaging said control lever and responsive to fuel pump pressure to move said lever to its stop position, said actuator being biased toward a nonoperative position that permits location of said lever in its run position, first and second conduit means connecting said actuator with opposite sides of said fuel pump to supply pressure therefrom in either direction of pump operation and selector valve means connected in said first and second conduit means and movable into "on" and "off" positions to control engine operation, said selector valve means being operative in the "on" position to shut off the first conduit from the engine side of the pump and open the second conduit from the supply side of the pump to permit normal engine operation but prevent reverse operation and said selector valve means being operative in the "off" position to shut off the second conduit from the supply side of the pump and open the first conduit from the engine side of the pump to supply pump pressure to the actuator during normal operation and thereby shut down the engine.

4,296,719
MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE HAVING MIXTURE CUT OFF MEANS

Koichi Takahashi; Fumio Hinatase, and Akira Shibanaka, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 20, 1979, Ser. No. 77,278
Claims priority, application Japan, Sep. 22, 1978, 53/117120; Sep. 25, 1978, 53/118158; Sep. 26, 1978, 53/118778
Int. Cl.³ F02D *17/00*
U.S. Cl. 123—198 F **9 Claims**

1. Internal combustion engine comprising a plurality of cylinders, intake passage means including first passage means leading to at least one of said cylinders and second passage means leading to the remainder of said cylinders, throttle valve means provided in said intake passage means and having a minimum opening position, means for providing a supply of combustible air and fuel mixture to said first and second passage means, shut-off valve means provided in said first passage means downstream of said mixture supply means and movable to a closed position for blocking the supply of the mixture to the cylinder associated with said first passage means, means for detecting that the throttle valve means is in the minimum opening position and moving the shut-off valve means to said closed position when the throttle valve means is in the minimum opening position, means for providing a supply of air to

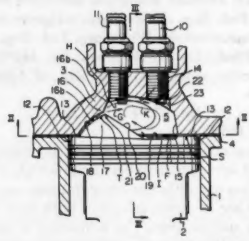


said cylinder associated with said first passage means, control means sensible to engine speed and throttle valve position and controlling said air supply means so that a substantial amount of air is supplied to said cylinder associated with said first passage means when the throttle valve means is in the minimum opening position and the engine speed is below a predetermined value but the air supply is essentially interrupted when the engine speed is beyond the predetermined value.

4,296,720
COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakanishi; Takeshi Okumura; Ryuichi Deguchi, all of Susono, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1979, Ser. No. 43,670
Claims priority, application Japan, Jul. 20, 1978, 53-87662
Int. Cl.³ F02B *23/08;* **F02P** *15/08*
U.S. Cl. 123—309 **12 Claims**



1. An internal combustion engine comprising:
a cylinder block having a cylinder bore therein;
a cylinder head having an inner wall mounted on said cylinder block;
a first raised portion formed on the periphery of the inner wall of said cylinder head, having a flat bottom face and projecting downwardly;
a piston reciprocally movable in said cylinder bore and

having a top face with a flat peripheral portion approachable to said flat bottom face, creating a first squish area therebetween at the end of the compression stroke for spouting out a first squish flow along the top face of said piston, said first squish area comprising an annular area between the flat peripheral portion of the top face of the piston and the flat bottom face of the cylinder head, said first squish area extending substantially along the entire periphery of the top face of said piston;

a combustion chamber defined by the inner wall of the cylinder head and the top face of said piston;

an intake valve movably mounted on said cylinder head in fluid communication with said combustion chamber;

an exhaust valve movably mounted on said cylinder head in fluid communication with said combustion chamber;

a second raised portion formed on the top face of said piston at a position opposite to said first raised portion with respect to an axis of said piston, having a rear face and a front face exposed to said combustion chamber, said rear face being approachable to the inner wall of said cylinder head so as to create a second squish area therebetween at the end of compression stroke for spouting out a second squish flow which moves forward in the upper interior of said combustion chamber in a direction opposite to the spouting direction of said first squish flow, said first and second squish flows cooperating with each other to create a strong swirl motion rotating about a horizontal axis in said combustion chamber;

a third raised portion formed on the inner wall of said cylinder head above said second raised portion having a bottom wall which cooperates with said rear face of said second raised portion for creating said second squish area; and

a pair of spark plugs located in said combustion chamber, comprising a first spark plug located near said first raised portion in a recess formed on the inner wall of said combustion chamber, said recess being located on an extension of said second squish area and extending outwardly beyond a straight line extending between the peripheries of said intake and exhaust valves, and a second spark plug located near said third raised portion, said first squish area extending inwardly from the periphery of the top face of the piston to a continuous, sinuous inner periphery which extends around and is almost vertically under the intake valve, the exhaust valve, and said spark plug recess and adjacent to said second raised portion, the surface area ratio of the sum of the first and second squish areas formed on the inner wall of the cylinder head and the first and second squish areas formed on the top face of the piston to the sum of the cross-sectional area of the cylinder bore and the surface area of the inner wall of the cylinder head, excluding the surface area of the vertical side wall of said first raised portion, is in the range of from 30 to 50 percent.

4,296,721

CONTROL SYSTEM HAVING AN IMPROVED CONDITION RESPONSIVE VALVE CONSTRUCTION

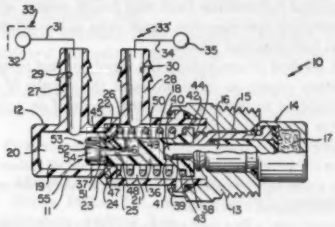
Everett T. Steele, Jr., Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 808,875, Jun. 22, 1977, Pat. No. 4,147,180. This application Jan. 10, 1979, Ser. No. 2,381

Int. Cl.[3] **F02P** *5/04*

U.S. Cl. 123—407 **1 Claim**

1. In a control system for an internal combustion engine having a vacuum manifold and a vacuum operated control device that is to be always interconnected to said manifold by a self-contained condition responsive valve construction when the temperature of said engine is above a certain temperature and is to be only substantially interconnected to said manifold through said valve construction when the vacuum valve of said manifold is greater than the vacuum value at said control device and the temperature of said engine is below said certain temperature, said self-contained condition responsive valve construction having a check valve means therein that substantially blocks the fluid interconnection between said manifold and said control device when said manifold vacuum value is less than the vacuum value of said control device and said temperature of said engine is below said certain temperature whereby said check valve means forms part of the self-contained structure of said valve constructure, said valve construction having valve seat means disposed between a pair of ports to interconnect the same together and having valve member means for opening and closing said valve seat means in response to a condition sensed thereby, one of said ports being interconnected to said manifold and the other of said ports being interconnected to said control device, said valve member means having a by-pass passage means therein for fluidly interconnecting said ports together even though said valve seat means is closed by said valve member means, said by-pass passage means having said check valve means therein to permit fluid flow through said by-pass passage means in only one



direction, said valve construction having a housing means carrying said valve seat means and said valve member means, said valve seat means being annular and said valve member means comprising a plunger that axially moves in said annular valve seat means, said plunger having a free end portion that projects beyond one side of said valve seat means in all positions of said plunger, said by-pass passage means having one end thereof leading to the exterior of said plunger at said free end portion thereof, said check valve means comprising a valve seat in said by-pass passage means at said free end portion of said plunger and a valve member for opening and closing said valve seat, the improvement wherein, said free end portion of said plunger has a restrictor means therein that leads from the exterior of said free end portion to said by-pass passage means intermediate said check valve seat and the other side of said valve seat means to always fluidly interconnect said ports together at a controlled rate.

4,296,722

CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

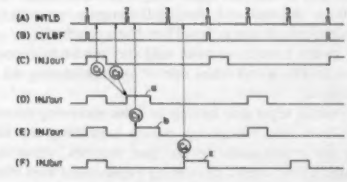
Toshio Furuhashi, and Osamu Abe, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1979, Ser. No. 60,751

Claims priority, application Japan, Jul. 26, 1978, 53-90432

Int. Cl.[3] **F02B** *3/10;* **G06F** *15/20*

U.S. Cl. 123—492 **13 Claims**



1. A control apparatus for an internal combustion engine comprising:

first means for generating a pulse train having a predetermined relation to the angle of rotation of the engine crankshaft, said pulse train including a plurality of reference pulses generated within each time period corresponding to one revolution of the engine crankshaft;

second means for generating a normal fuel injection signal, to control a fuel injector, the time of occurrence of which signal depends upon the time of occurrence of one of said reference pulses;

third means for detecting an accelerating engine condition;

fourth means, coupled to said third means, for detecting whether the accelerating condition has occurred at a time between said one of the reference pulses and an adjacent subsequent reference pulse; and

fifth means for generating a corrective fuel injection signal, the initiation of which is governed by a subsequent to said adjacent subsequent reference pulse in response to the detected information from said fourth means, so that said corrective fuel injection signal does not overlap the normal fuel injection signal.

10. A method of controlling the supply of fuel to an internal combustion engine so as to augment the supply of fuel normally supplied to the engine, in the event of an acceleration condition, comprising the steps of:

(a) generating a train of pulses in accordance with the rotation of the engine crankshaft, said train of pulses containing a plurality of reference pulses for every one revolution of the engine crankshaft;

(b) generating a first fuel supply signal to control the normal supply of fuel to the engine, the time of occurrence of which is governed by one of said reference pulses;

(c) detecting an acceleration condition of the engine;

(d) detecting whether the occurrence of the acceleration condition of the engine has occurred at a time between said one of said reference pulses and a subsequent adjacent reference pulse; and

(e) generating a second fuel supply signal the time of occurrence of which is synchronized with or subsequent to said subsequent adjacent reference pulse, whereby the supply of fuel to the engine is augmented so as not to overlap the normal supply of fuel to the engine.

4,296,723

ENGINE FUEL SYSTEM WITH FUEL/WATER SEPARATION

Frederic C. Aldrich, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

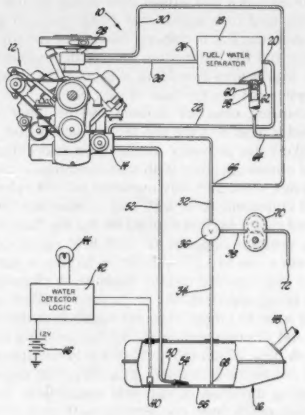
Filed Dec. 17, 1979, Ser. No. 104,308
Int. Cl.[3] **F02M** *55/00;* **B01D** *17/00*
U.S. Cl. 123—510 **1 Claim**

1. A liquid fuel supply system for an engine in which the fuel may have some water entrained therein which should be removed before the fuel is used in the engine, said system comprising:

a fuel storage tank having a fuel inlet, a fuel outlet, a return inlet and means for detecting a predetermined level of water in the tank and alerting the engine operator that the predetermined water level has been reached;

a fuel pump connected with said fuel outlet to receive fuel from said tank and when operating pressurizing the fuel so received;

a fuel/water separator having an inlet receiving pressurized fuel from said fuel pump, means separating the fuel and any water entrained in the fuel received from the fuel pump, a first outlet delivering pressurized fuel from said separating means to said engine for use therein, a second outlet including orifice means receiving water from said separating means, said second outlet being connected to said tank return inlet for returning pressurized separated water to said tank;



said separated water being retained in said tank and activating said detecting and alerting means when said predetermined water level in said tank is reached;

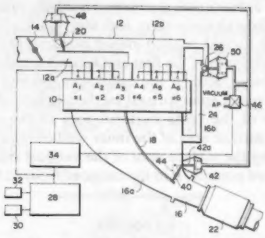
and means for removing water from said tank.

4,296,724

INTERNAL COMBUSTION ENGINE

Haruhiko Iizuka, Yokosuka, and Fukashi Sugasawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 28, 1979, Ser. No. 108,228
Claims priority, application Japan, Jan. 8, 1979, 54-1186
Int. Cl.[3] **F02M** *25/06*
U.S. Cl. 123—568 **8 Claims**



1. An internal combustion engine comprising:

(a) a plurality of cylinders split into first and second groups;

(b) an intake passage provided therein with a throttle valve and being divided downstream of said throttle valve into first and second branches, said first branch communicating with said first group of cylinders, and said second branch communicating with said second group of cylinders;

(c) an exhaust passage having its upstream portion divided into first and second branches, said first branch communicating with said first group of cylinders, and said second branch communicating with said second group of cylinders;

(d) an EGR passage having its one end opening into said second branch of said exhaust passage and the other end opening into said second branch of said intake passage;

(e) control means for providing a first signal under high

engine load conditions and a second signal under low engine load conditions;

(f) first valve means provided in said second branch of said exhaust passage downstream of the opening of said EGR passage, said first valve means being responsive to the first signal for opening said second branch of said exhaust passage and being responsive to the second signal for closing the same;

(g) second valve means provided in said second branch of said intake passage, said second valve means being responsive to the first signal for opening said second branch of said intake passage and being responsive to the second signal therefrom for closing the same; and

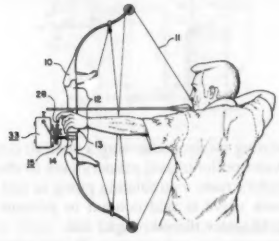
(h) third valve means provided in said EGR passage, said third valve means being responsive to the first signal for closing said EGR passage and being responsive to the second signal for opening the same.

4,296,725

ARCHERY BOW IMPROVEMENT AND CAMERA THEREFOR

Ronald J. Broderick, 3183 S. 8240 West, Magna, Utah 84044

Filed Jul. 27, 1979, Ser. No. 61,483
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—24 R **3 Claims**



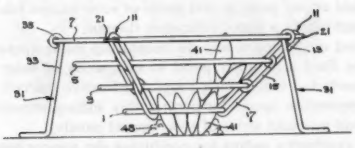
1. In combination, an archery bow, and forwardly-facing camera means attached to said archery bow, said camera means comprising a camera, a padded case encasing said camera and having aperture means accommodating exposure-functioning of said camera, said case being provided with spring-biased means for effecting selective camera film-advance, said case also being provided with shutter-trip control means adjustably secured relative to said archery bow.

4,296,726

COLLAPSIBLE CHARCOAL LIGHTING HOLDER

Jim Ross, P.O. Box 5204, and John Vilicich, 836 S. Gaffey St., both of San Pedro, Calif. 90731

Filed Nov. 26, 1979, Ser. No. 97,518
Int. Cl.³ A47J *37/00*
U.S. Cl. 126—25 B **6 Claims**



1. An operably collapsible device for holding charcoal in a manner to facilitate ignition, comprising

a series of successively larger, nesting, similar, plane geometric shapes

at least three slidable interconnecting means spaced equidistant around the circumference of said plane geometric shapes such that,

when the largest of said plane geometric shapes is suspended horizontally, the series of shapes depend therefrom, spaced apart approximately equally, to form an inverted truncated cone or pyramid, and

when said plane geometric shapes are allowed to rest on a horizontal surface said plane geometric shapes nest together in one horizontal plane

at least two support members foldably connected to the largest of said plane geometric shapes such that

as a first alternative, said support members may be positioned fully erect causing the largest said plane geometric shape be suspended approximately horizontally, with the remaining plane geometric shapes depending therefrom to form an inverted truncated cone or pyramid, the lowest portion of which is suspended slightly above the plane of the lower extremities of said support members, and

as a second alternative, said support members may be positioned extending radially out from the largest of said plane geometric shapes, and

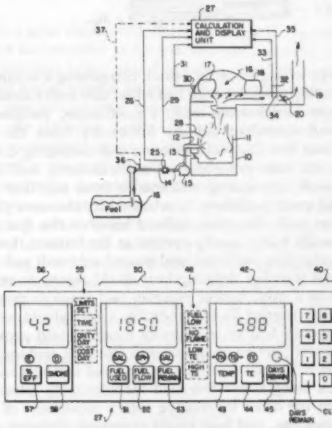
as a third alternative, said support members may be positioned folded over said plane geometric shapes.

4,296,727

FURNACE MONITORING SYSTEM

Edward L. Bryan, Dallas, Tex., assignor to Micro-Burner Systems Corporation, Addison, Tex.

Filed Apr. 2, 1980, Ser. No. 136,719
Int. Cl.³ F24H *3/00;* **G01L** *3/26;* **F23N** *1/00*
U.S. Cl. 126—116 A **8 Claims**



1. A monitoring and display apparatus for use in combination with a heating system of the type having a combustion chamber, adjustable means for supplying air to said combustion chamber to support combustion, an exhaust duct for exhausting combustion products from the combustion chamber, a fuel input nozzle and conduit means connectable to a fuel source for supplying fuel to the combustion chamber, and a heat exchanger in the gas flow path between the combustion chamber and the exhaust duct for heating a fluid medium, the apparatus comprising

first and second transducer means for sensing the temperatures at the combustion chamber and the exhaust duct, respectively, and for producing electrical signals representative of said temperature;

third transducer means coupled to said conduit means for

sensing the rate of flow of fuel to said fuel input nozzle and;

logic display means electrically connected to said transducer means for calculating and selectively displaying parameters representative of the operation of said heating system comprising

a clock;

memory means for storing digital data representative of the temperature and flow rate parameters sensed by said transducers and of preselected limit values for selected ones of said parameters;

input means including a keyboard for manually supplying said preselected limit values to said memory means;

calculator means responsive to said clock and to the sensed parameters stored in said memory means for calculating fuel usage per unit time and for supplying signal representative thereof to said memory means; and

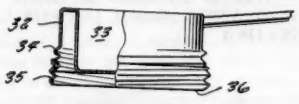
alarm means for periodically comparing said limit values with the sensed parameters and for providing a perceivaable indication when said limit values are exceeded.

4,296,728

ENERGY SAVING POTS, PANS AND ADAPTER

Robert A. Hofstetter, 2436 Birch Log Way, Hacienda Heights, Calif. 91745

Filed Oct. 30, 1978, Ser. No. 899,984
Int. Cl.[3] **A47J** *27/00;* **B65D** *8/06*
U.S. Cl. 126—376 **1 Claim**



1. An energy saving cooking vessel, comprising a container member including a bottom wall and a first side wall extending upwardly from said bottom wall, a continuous, peripheral, transverse wall extending radially outwardly from the top periphery of said first side wall, a second wall extending downwardly from the outer periphery of said transverse wall, said second side wall surrounding and spaced from said first side wall from said outer periphery to substantially the same plane as said bottom wall, the space defined between the first and second side walls being axially opened at the bottom thereof while being otherwise enclosed, said second side wall and said transverse wall together defining heat shield means to retain rising heat from a stove burner entering said space to thereby conserve energy needed during cooking, a heat shield extension adjustably attached by securement means to said cooking vessel at the lower portion of said second side wall, said securement means including said second side wall and said heat shield extension each being screw-threaded for adjustably telescoping one within the other by relative rotary movement of the vessel and extension, said heat shield extension allowing said cooking vessel to be elevated at different heights and aiding in retaining rising heat within said space at the elevated heights.

4,296,729

SOLAR HOT WATER HEATING SYSTEM

George H. Cooper, Bridgton, Me., assignor to Suntime, Inc., Bridgton, Me.

Filed Feb. 4, 1980, Ser. No. 118,486
Int. Cl.[3] **F24J** *3/02;* **F24D** *11/00*
U.S. Cl. 126—421 **8 Claims**

7. A solar hot water heating system comprising

a solar heat collector

a primary water heating and storage tank located at a level above said collector

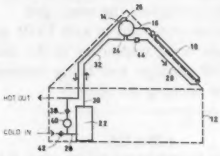
a heat exchanger within said tank

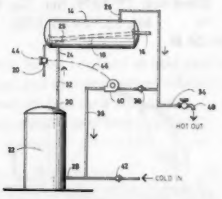
means for circulating a heat absorbing medium through said collector and heat exchanger so that it receives heat in the collector and releases its heat in the heat exchanger and returns by gravity to the collector

a secondary water preheating and storage tank located at a level below said collector and said primary tank

the inlet of said secondary tank being adapted to be connected to a source of cold water under pressure and having its outlet connected to the inlet of said primary tank

means for recirculating hot water from said primary tank to said secondary tank,





said recirculating means comprising a conduit connecting the hot water outlet of said primary tank to the inlet of said secondary tank, a circulating pump in said conduit and a check valve in said conduit to prevent reverse flow of cold water therethrough, and

control means responsive to a condition in said primary tank for activating and deactivating said pump so that only surplus hot water from said primary tank will be returned to said secondary tank.

4,296,730

CONTROL SYSTEM FOR A SOLAR STEAM GENERATOR

Allan J. Zadiraka, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 941,700, Sep. 12, 1978. This application May 5, 1980, Ser. No. 146,925
Int. Cl.[3] **F24J** *3/00*
U.S. Cl. 126—421 **5 Claims**

1. A control system for a solar steam generator comprising:

a series of solar-heated panels connected together to allow fluid flow therethrough;

first measuring means for measuring the temperature of the fluid at one point in said series of solar-heated panels and establishing a signal indicative thereof;

second measuring means for measuring the temperature of the fluid at another point in said series of solar-heated panels and establishing a signal indicative thereof;

attemperation means for controllably adding attemperation fluid into said series of solar-heated panels;

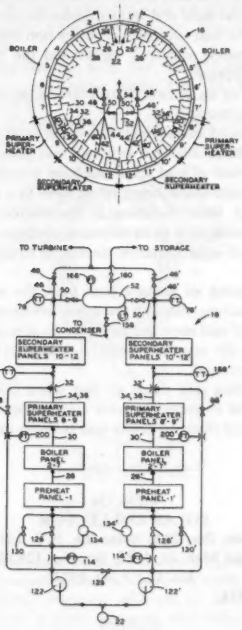
first combining means for combining the temperature measurement signals of said first and second means to establish a first control signal for controlling the amount of flow through said attemperation means;

variable fluid flow means for providing a variable flow of fluid through said solar-heated panels;

fluid flow measuring means for measuring the amount of

fluid flow through said solar-heated panels and establishing a signal indicative thereof; and

second combining means for combining said first control signal from said first combining means with the signal from said fluid flow measuring means to establish a second control signal for controlling fluid flow from said variable fluid flow means.



4,296,731

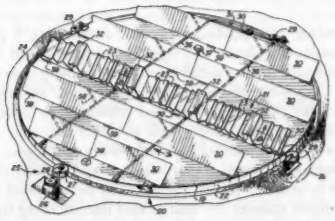
TRACKING BOOSTER AND MULTIPLE MIRROR CONCENTRATOR FLOATING COLLECTOR

C. Brent Cluff, 5525 N. Grande, Tucson, Ariz. 85704

Continuation-in-part of Ser. No. 836,356, Sep. 26, 1977, Pat. No. 4,148,301. This application Jun. 1, 1978, Ser. No. 911,434

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—424 **15 Claims**



1. A heat exchange means comprising:

a floating platform,

means for positioning said platform for arcuate movement through a given path when floating on a liquid,

a plurality of arrays of juxtapositioned parallelly arranged reflectors each mounted on the top of said platform,

at least one solar ray collector panel mounted on each array to extend longitudinally of said reflectors and disposed with its axis in the focal zone of said reflectors,

each array of said reflectors comprising at least one pair of reflector surfaces with one of each pair being angularly arranged on different sides of a given collector panel for directing the solar rays toward the collector panel, and

platform actuating means for moving said platform about an arcuate path for tracking the sun in an azimuthal mode.

4,296,732

SOLAR RADIATION COLLECTOR

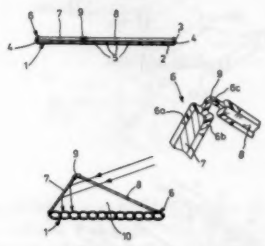
Winfried Bernhardt; Edgard Grundmann, and Rudolf Kroll, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,397

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903775

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—426 **4 Claims**



1. In a solar radiation collector composed of a mat formed of a black foil member and a radiation pervious foil member, the two members being joined together along the outer edges of the mat and at interior locations of the mat to form an extended flow path and an inlet and outlet for a fluid heat carrier medium, the collector further including cover means connected to the mat along opposed edges thereof and arranged to be disposed in the path of solar radiation toward the mat with an air space being defined between the mat and the cover means, the improvement wherein said cover means includes flexible mounting means formed adjacent opposed edges thereof for holding at least one radiation pervious pane and at least one reflecting panel, and said flexible mounting means and said mat are dimensioned such that, when such pane and panel are held by said flexible mounting means and said mat is filled with such carrier medium, said flexible mounting means holds the pane and panel in relative positions such that the pane, the panel and said mat constitute the legs of a triangle enclosing the air space.

4,296,733

HEATING, LIGHTING AND VENTILATION SYSTEMS

Norman B. Saunders, 15 Ellis Rd., Weston, Mass. 02193

Filed Aug. 5, 1976, Ser. No. 712,098

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—428 **30 Claims**

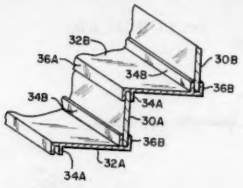
1. A device for controlling the amount of incoming solar radiation entering an enclosed structure and for reducing the amount of interior heat radiation loss from said structure, said device comprising, in combination:

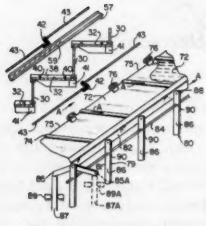
a first plurality of substantially flat members each substantially reflective to said solar radiation;

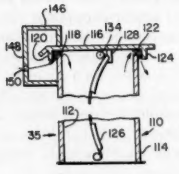
a second plurality of substantially flat members, each substantially transmissive to said solar radiation; means for securing said first and second plurality of substantially flat members to one another and to said enclosed structure so that said members of said first plurality are oriented in substantially horizontal parallel planes between adjacent members of said

second plurality and members of said second plurality are oriented in substantially vertical parallel planes between adjacent members of said first plurality so as to form a staircase-like construction, and so that said construction is inclined from the top of said construction to the bottom of said construction toward the equator and so that said incoming solar radiation, the direction of which varies according to the altitude and azimuth of the sun, is transmitted at least in part directly through said members of said second plurality when the sun is at average winter altitudes and substantially reflected from said members of said first plurality away from said enclosed structure when the sun is at average summer altitudes; and

a pair of panel assemblies mountable on said enclosed structure so as to be spaced and disposed parallel to one another on the interior and exterior sides of said first and second plurality of said members.







22. Apparatus for controlling the amount of solar radiation entering an enclosed structure comprising, in combination;

a plurality of window units, each of said units including means for reducing the amount of heat transfer through said unit, at least two panels transmissive to said solar radiation, and means for drawing air from the exterior of said structure along a path defined between said panels to the interior of said structure so as to reduce the loss of heat from the interior of said structure through said units; and

means disposable around the perimeter of said structure for providing air exterior of and from all sides of said structure to said path defined between said panels of each unit so as to substantially equalize the pressure of said air drawn through said units.

24. Apparatus for controlling the amount of direct solar heat and light entering an enclosed structure, said apparatus comprising, in combination;

tank storage means substantially transparent to said light for absorbing at least a part of said direct solar heat and for reradiating stored heat into the interior of said enclosed structure; and

a plurality of adjustable louvers disposed between said tank storage means and said interior of said enclosed structure for controlling the heat and light transfer between the sun and the interior of said enclosed structure and the heat and light transfer between said tank means and the interior of said enclosed structure.

28. For use in an enclosed structure, a device including a window unit comprising:

at least two spaced apart panels transmissive to solar radiation;

a retractable shade disposed between said panels for controlling the amount of said solar radiation transmitted through said panels, said shade being retractable to a retracted position wherein solar radiation is transmitted through said panels and extendable to an extended position so as to reduce the amount of solar radiation transmitted through said panels;

means for drawing air along a path from the exterior of said enclosed structure, through the space between said panels to the interior of said enclosed structure so as to reduce the loss of heat from the interior of said enclosure to the exterior of said enclosure; and

means for guiding said shade so that when said shade is extended to said extended position said shade assumes a convex, contoured shape to define said path for said air between said panels.

4,296,734

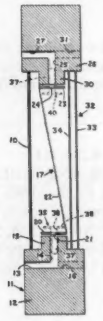
SOLAR COLLECTOR

Robert L. Nevins, Rte. 28A, Boiseville, N.Y. 12412

Filed Mar. 10, 1980, Ser. No. 129,033

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—431 **2 Claims**



1. A heating and cooling structure comprising a pair of spaced translucent glazes, a frame for mounting said spaced glazes, said frame having members at two opposite ends of said glazes for engaging said glazes therebetween, passageways formed in said oppositely disposed members to selectively establish fluid communication from either of the sides of said members with the volume established within said frame, a heat sink mounted within said frame between said spaced translucent glazes in order to absorb radiant solar heat applied to said structure and to transfer the heat to said fluid flowing through said volume established within said frame from either of said selected sides of said frame members, said heat sink being a mesh disposed within said frame volume, said mesh being generally coextensive with said spaced glazes, a laterally slidable vent cover received in said frame for movement therewithin, and a plurality of uniformly spaced apertures formed in said vent cover for selective alignment and misalignment with said frame passageways in order to promote and to stop fluid

flow between the side of the frame member in which said vent cover is received and the volume established within said frame.

4,296,735

DEVICES TO EXPLOIT SOLAR ENERGY

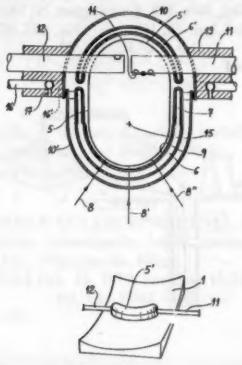
Alfredo B. Llorach, 17-B Bellavista St., San Antonio Abad (Ibiza), Spain

Filed Oct. 13, 1978, Ser. No. 951,240

Claims priority, application Spain, Oct. 20, 1977, 463.413; Sep. 22, 1978, 473.620

Int. Cl.³ F24J *3/02;* **G02B** *11/04, 5/08*

U.S. Cl. 126—438 **6 Claims**



1. An improved solar collector comprising, in combination, a plurality of concave reflecting elements, each of said reflecting elements being disposed adjacent to another reflecting element to define a panel, each of said reflecting elements having an identical reflecting surface with a focal point, said focal point of each other reflecting surface not coinciding, a solar radiation absorbing element having an absorbing surface disposed on said focal points of each of said elements, means for directing a fluid medium through the radiation absorbing element to convey heat from said absorbing element, each of said reflecting elements having a periphery defined by a projection of a polygon so that the periphery of all the reflecting elements match the periphery of their adjacent reflecting elements, the concavity of each of said adjacent elements contacting each other along the periphery of each polygon, the total surface areas of the reflecting surface of said elements not being less than the area defined by the periphery of said panel, the concavity of each of said reflecting elements being defined by a predetermined curvature to achieve in the solar beam reflecting a focal zone above the reflection surface thereof due to the course of the sun, and said absorbing surface of said absorbing element being coincident with said focal zone.

4,296,736

FOLDED PLATE SOLAR ENERGY COLLECTOR

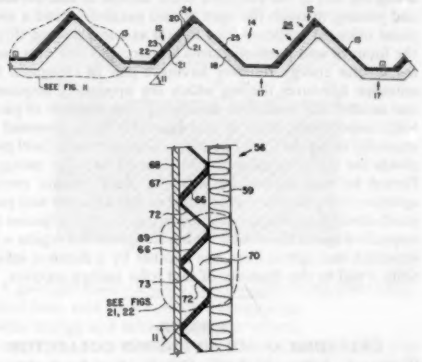
Olaf Soot, 9 Tomahawk La., Greenwich, Conn. 06830

Filed Dec. 3, 1979, Ser. No. 100,016

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **15 Claims**

5. A wall or roof panel for use in a building in a solar collector system, comprising an elongated folded plate structural member composed of at least one collector first plate element and at least one adjoining connecting second plate element alternately arranged in a substantially zig-zag manner, structural means connecting together the adjacent edges of each collector first plate with the adjoining connecting second plate, the plane of the collector first plate extending at a predetermined tilt angle with respect to the plane of the second plate whereby the collector first plate can be located transverse to impinging solar energy when the panel is mounted in operative position, said collector first plate having an areal portion absorbent of solar energy and a wall transparent to solar energy mounted in front of the absorbent portion, means for heat insulating the absorbent portion from ambient temperature, and means providing fluid flow across the collector first plate and in heat-exchange relationship with the absorbent portion, whereby solar energy when impinging on said transparent wall will be transmitted therethrough to be absorbed by the absor-



bent portion which in turn transfers heat to the fluid passing across the collector first plate, said folded plate structural member and said edge connections between connecting first and second plate elements forming a stiffened integral structure which is substantially self-supporting and capable of functioning as a load-bearing solar-energy-receiving structural element when installed in said operative position as an integral wall or roof panel of a building.

4,296,737

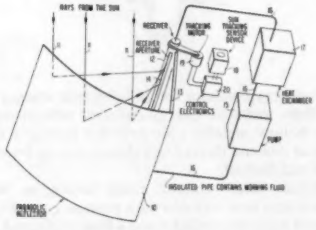
PARABOLIC TROUGH CONCENTRATING SOLAR COLLECTOR

John K. Silk, Wellesley, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Dec. 5, 1979, Ser. No. 100,612

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **11 Claims**



1. A concentrating solar collector for use in a solar energy system, said collector comprising a radiation reflective surface having the configuration of a paraboloid of translation, said paraboloid defining a focal line that is spaced from the parabolic cross section of said surface and extends in a direction transverse to the axis of said parabolic cross section, one of the outermost extremities of said reflective surface being defined by an elongated lip that is positioned substantially in a plane passing through said focal line and oriented perpendicular to said axis, and means for supporting an elongated solar energy

receiver along said focal line, said receiver having an elongated entrance aperture of fixed dimensions therein for admission of solar energy reflected by said surface, said entrance aperture being oriented at an angle to said axis, the plane of said entrance aperture being displaced from said axis by a fixed angle in the range of 20° to 40°.

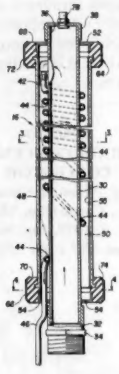
8. A concentrating solar collector for use in a solar energy system, comprising a radiation reflective surface which includes a pair of paraboloids, the axial extent of each said paraboloid being substantially confined between a first plane lying along the axis of the parabolic cross section of said paraboloid and passing through the apex of said paraboloid and a second plane oriented perpendicular to said axis and passing through the focus of said parabolic cross section, said collector including a solar energy receiver having a pair of elongated fixed entrance apertures therein which are oppositely disposed to one another and which are associated with said pair of paraboloids respectively, each of said apertures being disposed substantially along the focal line of an associated one of said paraboloids for the admission to said receiver of solar energy reflected by said paraboloid with the plane of said entrance aperture being disposed at an angle to said axis, and said pair of paraboloids being interconnected to one another adjacent their respective apices by an intervening elongated flat region which separates said apices from one another by a distance substantially equal to the diameter of said solar energy receiver.

4,296,738

CYLINDRICAL SOLAR ENERGY COLLECTOR

Wallace G. Kelton, 1748 NE. 58th St., Fort Lauderdale, Fla. 33334

Filed Jun. 3, 1980, Ser. No. 156,147
Int. Cl.³ F24J *3/02*; F28F *1/00*
U.S. Cl. 126—443 **15 Claims**



1. A solar energy collector for utilizing solar energy to heat a working fluid, said solar energy collector comprising:

a generally hollow metallic core cylinder having a working fluid inlet at one end thereof and closure means fitted across the other end thereof;

a single metallic return conduit means having an inlet end tapped into said core cylinder in a posture generally at the other end of said core cylinder and a fluid outlet end extending generally adjacent to said inlet end of said core cylinder. said return conduit means being wrapped in intimate heat exchange contact about said core cylinder;

transparent cylindrical tube means coaxially mounted about said core cylinder and having a diameter sufficiently greater than said core cylinder such that a peripheral space exists between the interior of said transparent cylinder and the exterior of said return conduit means wrapped about said core cylinder; and

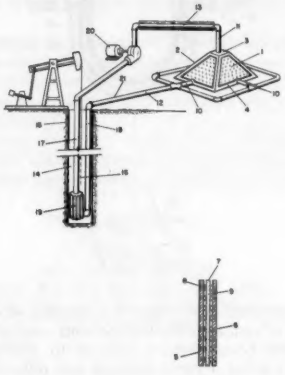
annular means at each end of said transparent cylinder means and said core cylinder for maintaining the spatial coaxial relationship of said core cylinder within said transparent cylindrical tube means and for forming an annular air insulation chamber around said core cylinder and said metallic return conduit means, wherein working fluid may be pumped into said core cylinder, pass through said core cylinder and said metallic return conduit within said transparent tube means and be heated by solar energy within the air insulation envelope.

4,296,739

SOLAR COLLECTOR USING COTTON SEED OIL TO TRANSFER HEAT TO HEAVY OIL WELLS

Gaines H. Bolding, Box 389, Farmington, N. Mex. 87401

Filed Jun. 23, 1980, Ser. No. 162,367
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—444 **3 Claims**



1. A solar collector having a generally truncated pyramid shape comprising a top, a bottom and four side panels wherein;

each side panel is constructed of a heat conductive metal, and has a center plate, an interior plate and an exterior plate, and;

the interior plate is dimpled and the exterior plate is dimpled and the center plate is flat, and the sides of each panel are sealed and a plurality of outlet ports are sealed into the top of each panel, and a plurality of inlet ports are sealed into the bottom of each panel, and the panels are mounted in a pyramid frame, and

the top and the bottom of the collector are sealed with non conductive material, and a suitable heat transfer fluid is forced to pass between the exterior plate and center plate, and between the interior plate and center plate, and wherein the collector is connected to circulating pipes of the system using heat.

4,296,740

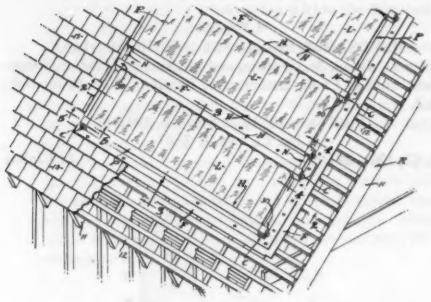
MODULAR SOLAR INSOLATION PANELS

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Continuation-in-part of Ser. No. 828,773, Aug. 29, 1977, Pat. No. 4,165,036. This application Jun. 26, 1979, Ser. No. 52,434
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—448 **22 Claims**

1. A solar insolation panel for installation upon an inclined roof plane substantially normal to the plane of the sun's traverse across the sky, and including; a multiplicity of transparent light focusing tubes disposed in substantially normal relation to the traverse plane of the sun and extending between spaced headers and open therethrough for the transport of fluid media therein, the transport tubes having elongated prismatic lens walls exposed to the sun's rays and focused to con-

dense the sun's rays into the fluid media within the tubes to absorb heat during the sun's traverse across the sky, and a



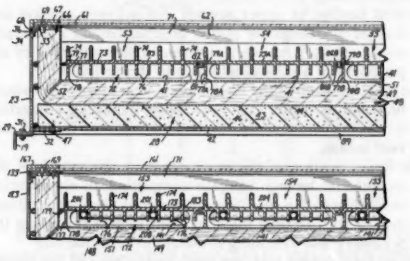
structural backing of insulation material underlying the tubes mounted thereto and secured to the roof.

4,296,741

SOLAR ENERGY COLLECTING PANEL ASSEMBLY

Willard J. Harder, Minneapolis, Minn., assignor to Bethany Fellowship, Inc., Minneapolis, Minn.

Filed Feb. 26, 1979, Ser. No. 15,313
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—449 **22 Claims**



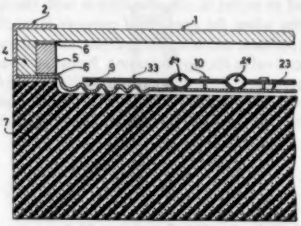
1. A solar energy collector unit comprising: an elongated generally flat plate having a first side, a second side, a first side edge, and a second side edge, a plurality of ribs secured to and projected away from the first side of the plate, said ribs extended in the longitudinal direction of the plate and disposed generally parallel to each other and having substantially the same height, a plurality of fins secured to and projected away from the second side of the plate, said fins extended in the longitudinal direction of the plate and disposed generally parallel to each other, each rib is a flat continuous rib member, said rib members being laterally spaced from each other a distance greater than the height of a rib, each fin is a flat continuous fin member, each of said rib members being in longitudinal alignment with a fin member, a longitudinal single foot secured to and projected away from the second side of the plate, said foot having a height greater than the height of the fins, first means on the first side edge of the plate adapted to be connected to a first adjacent collector unit, said first means comprising a flange extended generally parallel with said plate and spaced therefrom forming a longitudinal groove extended in a direction generally parallel to the plate, and second means on the second side edge of the collector unit adapted to be connected to a second adjacent collector unit, said second means comprising a tongue projected laterally away from the plate and extended in a directi n generally parallel to the plate, said tongue adapted to fit int a longitudinal groove of the second adjacent collector unit.

4,296,742

FLAT SOLAR ENERGY COLLECTOR WITH LOW HEAT CONTACT BETWEEN ABSORBER AND EDGE OF COLLECTOR

Eckart Hussmann, Ober-Olm, Fed. Rep. of Germany, assignor to JENAer Glaswerk Schott & Gen., Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,189
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725633
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **9 Claims**



1. A gas-tight solar collector unit for converting solar radiation into heat, said solar collector comprising:

a solar energy and infrared absorber means;

a cover means transparent to radiant solar energy overlying and in a spaced relation to said absorber means;

edge structure means for maintaining said absorber means and cover means in spaced relation to provide an airspace located therebetween; and

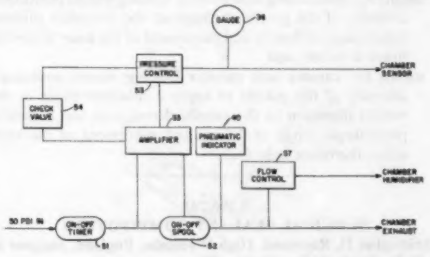
said absorber means having means for connecting said absorber means to said edge structure means such that no direct thermal contact exists between the edge of said absorber means and said edge structure means and providing a gas-tight seal for said airspace.

4,296,743

HYPERBARIC OXYGEN CHAMBER WITH FLUIDIC CONTROL

Robert A. Lasley, 11 Wardell Ave., Rumson, N.J. 01760

Filed May 24, 1979, Ser. No. 42,114
Int. Cl.³ A61H *31/02*
U.S. Cl. 128—30 **2 Claims**



1. A low pressure hyperbaric device for treatment of a patient including a two part chamber with means for holding the two parts in assembled and sealed condition, the chamber having an entrance adapted to allow the introduction of a body part, means associated with the entrance to seal the body part to thereby provide an air tight chamber, a pressured source of oxygen and means for cyclically pressurizing the hyperbaric chamber with oxygen and exhausting the hyperbaric chamber said means comprising:

timing means for controlling overall treatment time connected in series with the pressurized source of oxygen,

said timing means including an on-off valve for starting and stopping flow, a spool valve fluidly connected to the timing means, said spool valve being moved to the open position upon receiving the oxygen flow from the valve in the timing means, a flow control device connected on its inlet side to the spool valve and to the hyperbaric chamber on its outlet side, said flow control device controlling flow into the hyperbaric chamber, a second flow line extending from the spool valve to an exhaust valve for the hyperbaric chamber, pressure control means having an inlet in communication with the pressure in the hyperbaric chamber and an outlet in communication with the spool valve whereby when the prescribed pressure is reached within the hyperbaric chamber the pressure control means closes the spool valve thereby releasing the exhaust valve so that the hyperbaric chamber pressure will be exhausted and whereby upon the return of the chamber to ambient pressure the spool valve is returned to open position for a new cycle.

4,296,744

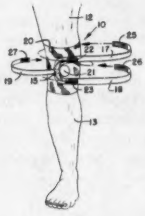
DYNAMIC PATELLAR BRACE

Pasquale M. Palumbo, 906 Frome La., McLean, Va. 22101

Continuation of Ser. No. 949,121, Oct. 6, 1978, abandoned. This application May 27, 1980, Ser. No. 153,708

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 C **12 Claims**



1. A dynamic patellar brace for preventing subluxation of a patella throughout the complete physiologic range of flexion and movement of the knee comprising:

means for bracing the patella;

means for maintaining said patellar bracing means positioned laterally of the patella throughout the complete physiologic range of flexion and movement of the knee when the brace is in use; and

means for causing said patellar bracing means positioned laterally of the patella to apply a resultant force in the medial direction to the patella throughout the complete physiologic range of flexion and movement of the knee when the brace is in use.

4,296,745

SURGICAL SEALANT COMPOSITION

Christopher D. Raymond, High Wycombe, England, assignor to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 13, 1979, Ser. No. 93,351

Claims priority, application United Kingdom, Nov. 20, 1978, 45281/78

Int. Cl.³ A61L *15/00*

U.S. Cl. 128—156 **10 Claims**

1. An adhesive surgical dressing which comprises a backing material provided on one side with a composition comprising per 100 parts, by weight, of a non-biodegradable, tacky, polymeric binding agent, selected from a group consisting of polyisoprene, polyurethane, silicone, and polyisobutylene, from 12 to 25 parts, by weight, of an inert reinforcing filler and a coating on at least the intended skin contacting face of the dressing of a non-biogradeable, water-activated polyacrylamide adhesive/thickner.

4,296,746

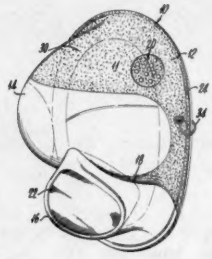
DISPOSABLE FULL-FACE SURGICAL MASK

Stanley I. Mason, Jr., Weston, and Michael D. Handler, Ridgefield, both of Conn., assignors to Surgikos, New Brunswick, N.J.

Filed Dec. 18, 1979, Ser. No. 104,948

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—201.15 **11 Claims**



9. A comfortable, lightweight, disposable full face mask adapted to be worn without claustrophobic effect, said face mask comprising:

a shell having an upper portion and a lower portion and formed of transparent plastic material having a generally oval periphery having a rim extending outwardly of the periphery at a substantial angle to the periphery;

the upper portion of the mask having vent means to dissipate heat and moisture, said vent means including a filtration means to prevent escape of particulate matter through said vent means,

the lower portion of the mask covering the mouth of the wearer and having a region comprising an air filtration medium which is an effective bacterial filtration medium,

a strip of soft, flexible material fixed to said rim along the periphery and extending inwardly of said rim; and

means for securing said face mask on the head of the wearer such that, when said mask is worn, said strip is hingedly flexed and lightly compressed against the head of a wearer with said shell covering the face of a wearer but positioned from a wearer's face.

4,296,747

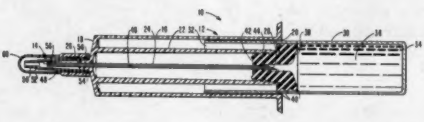
CATH-A-JET

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, El Monte, Calif.

Filed Feb. 11, 1980, Ser. No. 120,532

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—220 **5 Claims**



1. A device for introducing fluid into catheters of the type which are partially receivable in the human urethra to drain urine from the bladder and have a free end fitment and/or a pierceable injection site, comprising:

syringe means actuable to expel fluid from an outlet at one end thereof;

connector means extending from said one end of the syringe

means and defining an axial fluid passage communicating with said outlet;

a first axially tapered surface portion of the connector means receivable in sealing relationship within the free end fitments of urethral catheters;

a second axially tapered surface portion of the connector means engageable in sealing relationship with a luer needle fitment;

said second tapered surface portion being smaller in diameter than and positioned outwardly of said first tapered surface portion; and

a transition surface portion between the first and second tapered surface portions, said transition surface portion comprising a step in the diameter of the connector means.

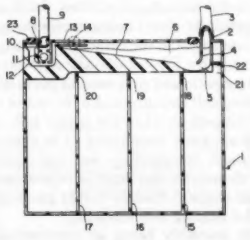
whereby fluid can be introduced into urethral catheters either through a free end fitment or an injection site for passage toward the human urethra.

4,296,748

UNDERWATER DRAINAGE APPARATUS WITH SEPARABLE SUCTION CONTROL CHAMBER

Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Jun. 27, 1979, Ser. No. 52,825
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—276 **5 Claims**



1. An underwater drainage apparatus comprising an integral container having an inlet adapted to be connected to the pleural cavity of a patient, an underwater seal chamber disposed beneath said inlet, a tube extending from said inlet into the lower end of said underwater seal chamber, a collection chamber for receiving fluid overflowing from said underwater seal chamber, an outlet in the upper end of said container, an outlet chamber surrounding said outlet within the container, a passageway interconnecting said outlet chamber with said underwater seal chamber, diaphragm means disposed within said outlet chamber, a separable suction control chamber attachable to said integral container, said suction control chamber including a U tube manometer having a small arm open to atmosphere and a large arm, a passageway extending downwardly from the upper end of the large arm of the U tube manometer and needle means having a bore therethrough disposed at the lower end of said passageway.

4,296,749

COLOSTOMY APPLIANCE

Edward J. Portifex, Virginia Beach, Va., assignor to Louis B. Fine, Norfolk, Va., a part interest

Filed Jul. 18, 1980, Ser. No. 170,057
Int. Cl.³ A61F *5/44*
U.S. Cl. 128—283 **17 Claims**

1. A colostomy appliance comprising, in combination,

a first pouch formed from first and second imperforate wall members of flexible plastic material connected together to form a flexible generally flat elongated container having a closed top and an open bottom,

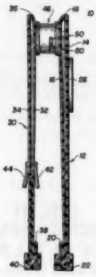
an inlet opening formed in the first sheet of the first pouch in downwardly spaced relation to the closed top,

attaching means surrounding the inlet opening for attaching the first pouch to the body of the person using the appliance,

a gas outlet opening formed in the second sheet of the first pouch adjacent the closed top thereof,

means for closing the open bottom end of the first pouch,

a second pouch formed from flexible synthetic resin sheet material and having a gas inlet opening therein, and



coupling means for releasably connecting the gas inlet opening of the second pouch to the gas outlet opening of the first pouch and providing a sealed gas flow path therebetween,

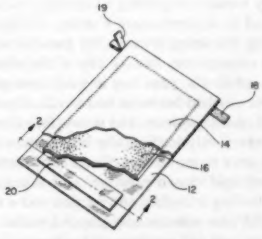
the coupling means including valve means for closing the gas outlet opening and the gas inlet opening when the gas inlet opening of the second pouch is not connected to the gas outlet opening of the first pouch.

4,296,750

REFASTENABLE PRESSURE-SENSITIVE TAPE CLOSURE SYSTEM FOR DISPOSABLE DIAPERS AND METHOD FOR ITS MANUFACTURE

Lin-Sun Woon, Appleton, and John C. Wilson, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 22, 1979, Ser. No. 51,048
Int. Cl.³ A41B *13/02*
U.S. Cl. 128—287 **9 Claims**



1. A pressure-sensitive tape closure system for disposable diapers, said diaper having in combination:

a fluid permeable facing sheet;

a backing sheet of a thin polyolefin film attached to the facing sheet along the periphery of the latter;

an absorbent pad disposed between said facing sheet and said backing sheet;

a pair of pressure-sensitive tape tab strips having a higher peel adhesion value than the tensile strength and tear resistance of said backing sheet attached to the backing sheet near the diaper corners along a portion of the length of said strips, said unattached portions being designed to

engage the exterior of said backing sheet in a predetermined attachment zone; and

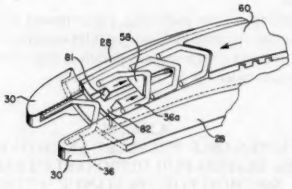
a hot melt adhesive layer having a lower modulus of elasticity and a Ring & Ball softening point lower than the modulus of elasticity and the heat distortion temperature of said backing sheet, respectively, the adhesive layer selectively located in the interior of said backing sheet underneath said attachment zone thereby increasing the stiffness of the film in said zone, said adhesive layer attached only to said backing in said zone.

4,296,751

SURGICAL DEVICE

Joseph W. Blake, III, R.R. #2, Box 106, Kitchewan Rd., South Salem, N.Y. 10590, and Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

Filed Aug. 2, 1979, Ser. No. 63,268
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—325 **19 Claims**



1. A surgical device, particularly a hemostat, comprising

an applicator having a pair of cooperating jaws provided with anvils and being movable between an open and a closed position; and

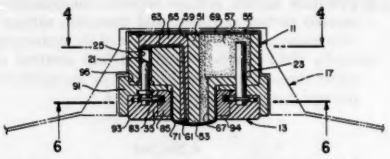
supply means for feeding surgical clips to said jaws, said supply means comprising a cartridge including a housing adapted to accommodate a string of clips, means for advancing the string towards the jaws for seriatim insertion of the respectively leading clip of the string between said anvils while the jaws are in said open position so as to become cinched between said anvils when the jaws move to said closed position, and means for retracting all except the respectively leading clip in direction away from said anvils prior to movement of said anvils from said open end towards said closed position, said housing comprising a body having a leading end section and a trailing end section and two substantially parallel tracks both extending between said end sections, said advancing means comprising biasing means for biasing a string of clips in one of said tracks lengthwise of the same towards said leading end section, and said retracting means including a retracting member in the other of said tracks and having a leading portion extending into and moveable in said one track between one position in which said leading portion is disengaged from said clips and permits the respectively leading clip to issue from said leading end section and another position in which said leading portion engages the clip immediately upstream of the leading clip and retracts it, and thereby said string of clips, in direction towards said trailing end section.

4,296,752

TRANSCUTANEOUS OXYGEN SENSOR WITH ADJACENT HEATER

Luther Welsh, San Clemente; Daryl J. Bergquist, Huntington Beach, and Hideo Watanabe, Fullerton, all of Calif., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 726,710, Sep. 24, 1976. This application May 11, 1979, Ser. No. 37,650
Int. Cl.[3] A61B *5/00*
U.S. Cl. 128—635 **10 Claims**



1. A sensor for transcutaneous measurement of partial pressure of gas, comprising:

a heater assembly;

a transcutaneous gas sensing cell which includes (a) a cathode, (b) a reservoir, (c) a membrane, and (d) electrolyte in the reservoir and forming an electrolyte path between the cathode and the reservoir;

said membrane including (i) a first portion having a front side disposed for direct contact with the patient's skin, and a back side adjacent the cathode but being separated from the cathode by a layer of said electrolyte defining said electrolyte path, and (ii) a second portion surrounding the gas sensing cell and disposed to be out of contact with the skin of the patient when the sensor is in use;

said heater assembly comprising (i) an annular heat conductive element surrounding said gas sensing cell but so spaced therefrom that heat is substantially not coupled from said element directly to said gas sensing cell, and (ii) means for heating said element;

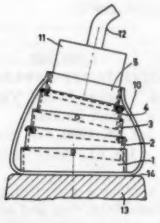
said heater assembly being so constructed, disposed and spaced relatively to said gas sensing cell as to be attachable to the skin of the patient for transfer of heat from said element to the skin, without such heat passing to the skin through the membrane and without substantial transfer of heat from said element to said gas sensing cell.

4,296,753

SUPPORT FOR A TRANSDUCER FOR EMITTING AND/OR RECEIVING ULTRASONIC SIGNALS IN A GIVEN ANGULAR SECTOR

Robert Goudin, La Varenne-St-Hilaire, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,025
Claims priority, application France, Sep. 19, 1978, 78 26771
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 **5 Claims**



1. A support for a transducer for emitting and/or receiving

ultrasound signals in a given angular sector with respect to a plane at the surface of an object, comprising:

a series of rotationally symmetrical, coaxial rings which includes a first ring, one or more intermediate rings, and a last ring, disposed one behind another along a line which connects the transducer with the surface of the object, the first ring being adapted for placement adjacent the surface of the object and the last ring being adapted for attachment to the transducer, the first and each succeeding intermediate ring in the series being pivotably connected to the following ring in the series so that the transducer can achieve a total angular rotation with respect to the first ring which at least equals the given angular sector and so that the distance between the transducer and the plane remains substantially constant as the transducer is rotated through that sector;

a deformable, liquid-tight bag enclosing the rings; and

coupling liquid means which fill the bag and surrounds the rings for coupling ultrasound signals from the transducer to the object.

4,296,754

METHOD FOR DETERMINING THE VALUE OF CARDIOLOGIC QUANTITIES AND APPARATUS FOR PERFORMING SAID METHOD

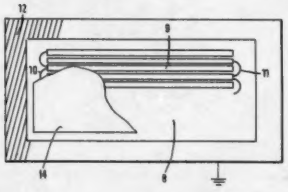
Ewald M. C. Hennig, Ostendstrasse 62, D-6000 Frankfurt 1, and Klaus Nicol, Adelheidstrasse 13, D-6000 Frankfurt 50, both of Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,438

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829269

Int. Cl.³ A61N *5/02*

U.S. Cl. 128—694 **9 Claims**



1. A method for determining the value of cardiologic quantities comprising:

encircling a portion of a body having a blood-conveying vessel with capacitor plates of a capacitor, so that the body portion engages the capacitor and defines the dielectric of the capacitor;

maintaining the capacitor plates fixed relative to one another; and

measuring changes in the capacitance of the capacitor.

4,296,755

METHOD AND APPARATUS FOR DETERMINING VENTRICULAR FIBRILLATION

Neil H. K. Judell, N. Kingstown, R.I., assignor to Datamedix Inc., Boca Raton, Fla.

Filed Mar. 19, 1980, Ser. No. 131,587

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—705 **30 Claims**

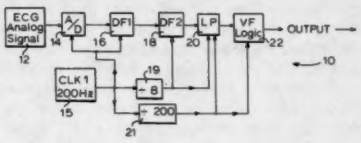
1. A method for declaring the presence of ventricular fibrillation from an incoming electrocardiograph signal comprising:

sampling said signal at a first frequency;

filtering said sampled signal to produce an output signal at a second frequency lower than said first frequency and to remove any DC components and baseline wander;

examining the spectrum of said filtered signal by passing the same to a linear predictor which fits a model signal spectrum to the actual signal spectrum and computes coefficients representative of bandwith and mean frequency of said signal over a short time interval; and

comparing said coefficient of bandwith with a preselected threshold value to determine whether it exceeds same, and



comparing said coefficient of mean frequency with a range of values to determine whether it falls within said range, and if both said determinations are positive, declaring ventricular fibrillation to be present.

4,296,756

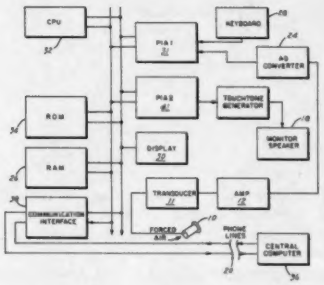
REMOTE PULMONARY FUNCTION TESTER

Ted E. Dunning, Denver, and Paul L. Enright, Englewood, both of Colo., assignors to Cyber Diagnostics, Inc., Denver, Colo.

Filed Jul. 26, 1979, Ser. No. 61,051

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—716 **8 Claims**



1. A pulmonary function tester capable of accurately producing, storing, transmitting, receiving and displaying selected information relating to the breathing maneuver of a test subject comprising:

a remote unit,

entry means associated with said remote unit for entering test subject data;

means communicating with said remote unit for accepting the breathing maneuver of a test subject,

means communicating with said accepting means for producing electrical signals proportional to the flow rates of the breathing maneuver of the test subject;

digitizing means communicating with said signal production means for converting the signals produced by the flow rates from the breathing maneuver into digital form representative of expiration flow rate and expiration time;

read/write memory means communicating with said entry means and said digitizing means for retrievably storing the test subject data entered through said entry means, and digitized test subject data from said digitizing means,

communication interface means communicating with said digitizing means and said read/write memory means for communication of signals including digitized test subject data, to and from at least one locus external to said remote unit,

display means communicating with said digitizing means, said rear/write memory means, said entry means and said communication interface means, for the display of test

subject data, entry data and communications fed back to said communication interface means; and

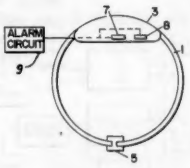
computer processing means for controlling the functioning of said remote unit including the representations displayed by said display means and responsive to preselected criteria obtained from said read/write memory, means said communication interface means and input from said entry means, and the sequence of function and manner of function of said communication interface means and said read/write memory means, so as to provide data on a test subject breathing maneuver which compares test subject flow rates with total expired volume for the subsequent diagnostic interpretation of pulmonary function.

4,296,757

RESPIRATORY MONITOR AND EXCESSIVE INTRATHORACIC OR ABDOMINAL PRESSURE INDICATOR

Thomas Taylor, 421 Randolph St., N.W., Washington, D.C. 20011

Filed Apr. 14, 1980, Ser. No. 139,686
Int. Cl.³ A61B *5/08, 5/10*
U.S. Cl. 128—721 **12 Claims**



1. A respiratory monitor for monitoring the respiration of a person said respiratory monitor comprising:

(a) detector means for detecting the expansion of the chest of the person;

(b) alarm circuit means coupled to said detector means for producing an alarm signal if said detector means does not detect expansion of the chest for a predetermined period of time; and

(c) strap means for mounting said detector means on the persons chest said strap means including compression means for compressing when the persons weight is placed thereon wherein said detector means are mounted on said strap means such that when the person lies on his chest the persons weight is absorbed by said compression means whereby said detector means is not affected by the position of the person.

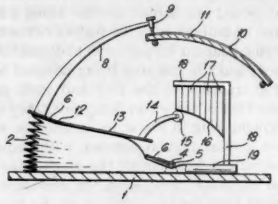
4,296,758

SPIROMETERS

Dietmar R. Garbe, Maids Moreton House, Maids Moreton, Buckingham, England

Filed Oct. 16, 1979, Ser. No. 85,273
Claims priority, application United Kingdom, Oct. 16, 1978, 40690/78; Jan. 25, 1979, 02625/79
Int. Cl.³ A61B *5/08*
U.S. Cl. 128—728 **13 Claims**

1. A spirometer having an inflatable bellows, inlet means for inflating said bellows, a movable member connected to said bellows having a locus along which said member is drivable progressively by said bellows during progressive inflation thereof, track means positioned, and having a course configured, to be engaged by and followed by said movable member during the progressive driving thereof along said locus and adjusting means for adjusting said configuration of said track means to provide locally adjustable opposition to movement of



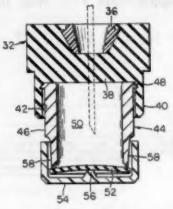
the movable member and, thereby, to the inflation of said bellows.

4,296,759

BLOOD COLLECTION DEVICE AND METHOD WITH ANTI-BACKFLOW MEANS

Joel A. Joslin, Sunset Hills, and Alan B. Ranford, Des Peres, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jun. 27, 1977, Ser. No. 810,257
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—766 **14 Claims**



1. A blood collection device comprising a container having one end closed and a blood collection chamber for receiving a blood sample, a needlepierceable stopper closing the opposite end of said container, said collection chamber normally having a negative pressure maintained therein by said stopper, and a one-way valve disposed in said container between said stopper and said collection chamber and operable to allow blood flow from a needle piercing said stopper to said collection chamber but preventing blood flow from said collection chamber to the needle.

4,296,760

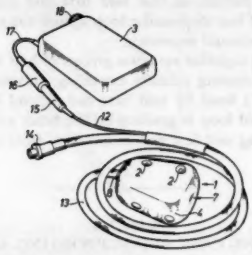
ELECTRICAL STIMULATOR

Per-Olov A. V. Carlsson, Sosdala, and Bo H. Hakansson, Lund, both of Sweden, assignors to Gambro AB, Sweden

Filed Nov. 26, 1979, Ser. No. 97,380
Claims priority, application Sweden, Nov. 27, 1978, 7812159
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—788 **13 Claims**

1. An electrical stimulator comprising an elongated element adapted for vaginal placement, said elongated element including a longitudinal axis, said longitudinal axis including a first end corresponding with a first end of said electrical stimulator and a second end corresponding with a second end of said electrical stimulator, said elongated element including a transverse cross-section throughout the length of said elongated element from said first end of said longitudinal axis to said second end of said longitudinal axis, said transverse cross-section having first and second perpendicular axes, said first perpendicular axis being greater than said second perpendicular

axis, and a plurality of electrodes carried by said elongated element, said electrodes being located on the surface of said elongated element on one side of a longitudinal cross-section of said elongated element corresponding with said first perpendicular axis, so that when said stimulator is vaginally placed in a direction corresponding with said longitudinal axis said elongated element is stabilized against rotation with all of said electrodes facing in a predetermined direction.

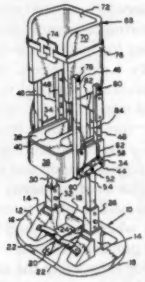


4,296,761

CONVERTIBLE PARAPODIUM

James H. Tyo, Jackson, Mich., assignor to Camp International, Inc., Jackson, Mich.

Filed Apr. 25, 1980, Ser. No. 143,608
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 G **7 Claims**



1. A parapodium for permitting crutchless standing and convertible to a seat without structural modification comprising, in combination, a base having a standing surface defined thereon and including lateral sides, a column mounted adjacent each base lateral side extending upwardly from said base each having an upper end, a pivot plate mounted upon each column upper end, a pair of parallelogram linkages each having a first end pivotally mounted upon a pivot plate and a second end each pivotally affixed to a back supporting member, horizontal leg bracing means extending between said pivot plates, a seat affixed to said linkages adjacent said back supporting member, elongated leg means supported by said back supporting member, and linkage locking means defined upon said pivot plates selectively engaging and releasing said linkages permitting said linkages to be pivoted from a vertical standing position wherein said seat is substantially vertically oriented and said leg means are in a raised position above said base to a substantially horizontal sitting position wherein said seat is substantially horizontally oriented and said leg means are in a lowered ground supported position off-set with respect to said base.

4,296,762

SMOKABLE PRODUCTS

Theobald Eicher, Dormagen, and Friedemann Müller, Neuss, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,490
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729759
Int. Cl.³ A24B *15/30, 15/42;* A24D *1/18*
U.S. Cl. 131—359 **12 Claims**

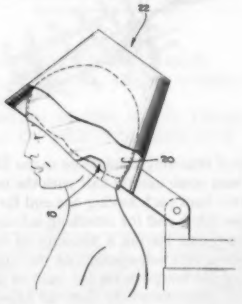
1. A process for the preparation of a smokable product based on cellulose and combustion-modifying substances which comprises saturating, spraying or coating a combustible, prefabricated material which is based on cellulose and optionally contains fillers customerily used in smokable products and which can be used as a smokable product with an electrostatically stabilized dispersion of solids as the internal phase in an external aqueous phase, the solids being electrically charged and having an average particle diameter of less than 2μ, the aqueous phase being a solution of salts of monobasic or polybasic carboxylic acids, whereby the solids are preferentially distributed on the surfaces of the smokable product.

4,296,763

HAIR CONDITIONER

Clayton W. Priest, 1413 E. 19th St., Santa Ana, Calif. 92701, and Edward T. Solomon, Huntington Beach, Calif., assignors to Clayton W. Priest, Redlands, Calif.

Filed Mar. 7, 1979, Ser. No. 18,424
Int. Cl.³ A45D *1/00*
U.S. Cl. 132—7 **4 Claims**



1. Process of applying hot oil to human hair including:

selecting a pervious, flexible, open celled, inert synthetic foam substrate which is generally uniformly preimpregnated with a hair revitalizing oil composition and adapted to conform generally to the scalp portion of a human head, said composition being generally a solid having a melting point from about 115 to 130 degrees Fahrenheit and being substantially all retained in said preimpregnated substrate at room temperature;

placing said preimpregnated substrate in direct contact with the scalp portion of a human head;

placing an oil impervious film over substantially the entire exterior of said substrate; and

applying heat at said substrate for a period of at least approximately 15 minutes to melt said composition and to release said composition from said substrate and to allow said composition to permeate said hair.

4,296,764

HAIR WAVING AND STRAIGHTENING METHOD

Thomas J. Pallone, Monroe; Mark Lynch, Southbury; Janice E. Corvino, Stratford, and John P. McCook, Madison, all of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Dec. 26, 1979, Ser. No. 107,746
Int. Cl.[3] A45D *7/00*
U.S. Cl. 132—7 11 Claims

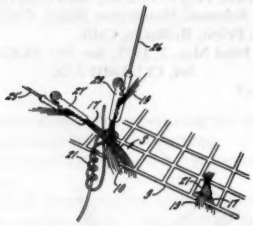
1. In a process for the cold waving or straightening of hair, the improvement which serves to provide longer-lasting results with less tendency to undergo hair lightening and increased tightness and springiness when used as a waving solution, comprising contacting the hair with an alkaline cold waving or straightening solution containing acidic metal sulfite and/or acidic metal bisulfite, capable of generating sulfur dioxide, followed by treating with an aqueous neutralizer solution having a pH between 2.0 and 5.0 and containing hydrogen peroxide in a concentration between 0.65 and 3.4 percent by weight giving a ratio of weight percent hydrogen peroxide in the neutralizer to weight percent sulfur dioxide from the waving/straightening solution of between 0.26 and 0.34.

4,296,765

METHOD AND APPARATUS FOR SECURING A HAIRPIECE

Stephen R. Bachtell, 1727 Crystal La., Mt. Prospect, Ill. 60056

Filed Dec. 18, 1978, Ser. No. 970,104
Int. Cl.[3] A41G *3/00*
U.S. Cl. 132—53 2 Claims



1. A method of attaching a hairpiece to the head of a recipient having at least some natural hair with the use of apparatus that includes two lines each having one end for attachment to the hair and the other end for attaching selected line tension weights, the hairpiece having a plurality of loops to which natural hair can be secured, comprising the steps of:

(a) positioning the hairpiece on the head of the recipient so that a series of the loops are disposed adjacent the recipient's natural hair;

(b) pulling a first group of the natural hair through an adjacent loop at a first attachment site;

(c) securing a first line to the end of said first group of hair;

(d) orienting said line and the first group of hair secured thereto to a predetermined angle with respect to the head of the recipient;

(e) applying a weight of preselected size to the other end of said line so as to impart a controlled amount of tension to said line and the group hair secured thereto such that said first group of hair is held without manual assistance in predetermined outwardly extending orientation with respect to said head;

(f) pulling a second group of natural hair adjacent said first attachment site outwardly from the recipient's head;

(g) securing a second line to the ends of said second group of hair;

(h) orienting said second line and said second group of hair attached thereto to a predetermined angle to the head while said first group of hair is held by said first line such that the first and second groups cross against each other over the loop;

(i) applying a weight of preselected size to the other end of said second line so as to impart a controlled amount of tension to said second line and said second group of hair secured thereto so that said first and second crossing groups of hair dispose the loop against the recipients head without manual assistance;

(j) securing together said two groups of hair while they are held in crossing relation extending outwardly from the recipient's head by said first and second lines so as to secure said loop in position on the head; and

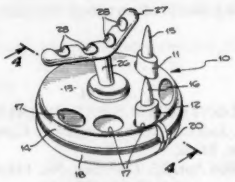
(k) detaching said first and second lines from said groups of hair.

4,296,766

MANICURING CASE AND SUPPORTING APPARATUS

Isak Benis, 525 N. Kings Rd., Los Angeles, Calif. 90048

Filed Jul. 14, 1980, Ser. No. 167,817
Int. Cl.[3] A45D *29/00*
U.S. Cl. 132—73 5 Claims



1. A manicuring case and supporting apparatus for use with liquid storing bottles having a tapered cross-section, said manicuring case and supporting apparatus comprising:

(a) a container having top and bottom members which define an interior cavity therebetween, said top and bottom members being pivotally coupled to one another to provide access to said interior cavity, said top member having a plurality of apertures disposed therethrough which are adapted to receive the liquid storing bottles;

(b) a resilient layer disposed upon and secured to the bottom member within the interior cavity whereby the liquid storing bottles are held in place intermediate said top and bottom members when the top and bottom members are pivoted adjacent one another; and

(c) support means for supporting the user's hand depending upwardly from the top member of said container, said support means including a base having a plurality of substantially uniform depressions disposed upon the top surface thereof.

4,296,767

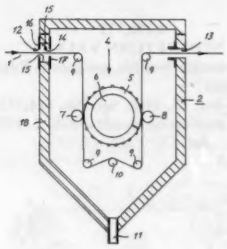
METHOD AND APPARATUS FOR CLEANING A CONTINUOUS WEB OF MATERIAL

Jan E. Hammar, Enebyberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Mar. 12, 1980, Ser. No. 129,673
Claims priority, application Sweden, Mar. 16, 1979, 7902382
Int. Cl.[3] B08B *5/04*
U.S. Cl. 134—15 16 Claims

4. A method for cleaning a web of material (1) to remove dust and other loose particles from the material (1) and comprising the steps of moving the web of material (1) through a suction chamber (2) having a web inlet (12) and a web outlet (13) having substantially the same cross sectional area, and at least one air outlet (11), connecting the one air outlet (11) to a source of sub-pressure, and restricting the amount of air enter-

ing the suction chamber (2) through the web inlet (12) to cause a greater amount of air to flow into the suction chamber (2)



through the web outlet (13) than flows into the suction chamber (2) through the web inlet (12).

4,296,768

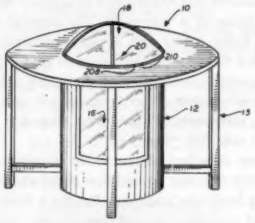
PORTABLE DISHWASHER

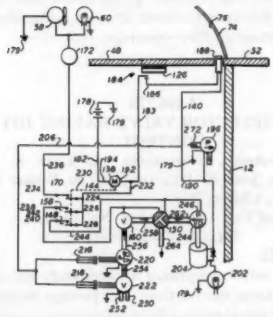
Rudy E. Saucedo, 1508 Bahama Way, San Jose, Calif. 95122

Filed Oct. 1, 1979, Ser. No. 80,416

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—47 **18 Claims**





1. A dishwasher of the type intended to receive therein and wash dishes and including a source of electrical power, said dishwasher comprising:

(a) a housing; said housing comprises a plurality of dish-receiving compartments;

(b) means within said housing for washing dishes so as to act upon dishes within said compartments;

(c) means for selectively coupling said washing means to at least a predetermined one of said compartments; and

(d) means for operating said dishwasher upon condition that said coupling means having first coupled said washing means to said compartment.

4,296,769

CLOSURE TREATMENT MACHINE

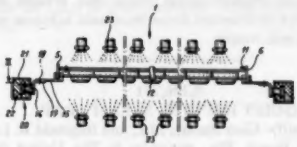
Arie van der Lugt, Krimpen an der Isssel, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Mar. 20, 1980, Ser. No. 131,911

Claims priority, application Netherlands, Mar. 21, 1979, 7902218

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—68 **13 Claims**



1. Machine for the treatment of head-shaped closures especially rubber closures fit for vials for containment of infusion or injection liquids provided with at least a means holding said closures during the cleansing stage and with nozzles in such positions that the cleansing liquid may be sprayed under several angles towards the closures characterized in that the means holdig the closures comprises one or more caskets having a number of parallel bars which are connected at both ends to each other by coupling plates whereby the parallel bars are arranged in such a way that the closures may find a place there between in the form of a row of a previously defined number and thereby held in such a way that the closures cannot be moved out of the space between the bars but do have such a tolerance that the cleansing liquid can reach any side of the closures whereby at least one of the coupling plates has an opening for passing the closures and the other coupling plate may form an eventual temporary barrier for the closures whereas a carrying means may lead the caskets filled with closures along nozzles spraying cleansing liquid.

4,296,770

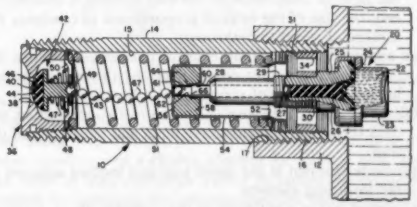
FREEZE DRAIN VALVE

Robert A. Rice, Chicago, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 28, 1980, Ser. No. 116,368

Int. Cl.³ F16K *17/00;* **G05D** *23/02*

U.S. Cl. 137—62 **12 Claims**



1. A temperature responsive valve for connection to a fluid conduit, said valve comprising:

(a) housing means defining a fluid chamber having an inlet and an outlet in communication therewith, said inlet being adapted for connection to a fluid conduit;

(b) valve means disposed without said chamber adjacent said outlet and including means movable between a first position effecting blockage of fluid flow from said inlet to said outlet and a second position enabling such fluid flow;

(c) means biasing said movable means to said first position;

(d) temperature sensitive means associated with said housing means and disposed adjacent said inlet, said temperature sensitive means operative to sense the temperature of fluid at said inlet and including actuator means movable with

respect to said housing means in response to said sensed fluid temperature; and,

(e) tension means operatively connecting said actuator means to said movable means wherein said tension means normally exerts no force on said movable means, but upon said temperature sensitive means experiencing fluid temperatures less than a predetermined value, said tension means enables said actuator means to move said movable means to said second position and at all fluid temperatures above said predetermined value said tension means is inoperative to transmit force from said actuator means to said movable means.

4,296,771

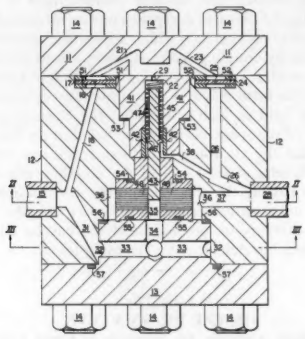
QUIET IMPULSE STEAM TRAP

Richard D. Claffy, Glen Burnie, Md., and Reginald B. Lovelace, West Palm Beach, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 969,741, Dec. 14, 1978, abandoned. This application Aug. 27, 1980, Ser. No. 181,931

Int. Cl.³ G05D *11/00*

U.S. Cl. 137—110 **9 Claims**



1. A steam trap comprising:

a first orifice and a second orifice connected in series, the first orifice connected to the input of the trap and the second orifice connected to the output of the trap wherein the flow of fluid through the two orifices is continuous and, the size of the orifices proportioned to minimize the leakage of steam therethrough;

an annular fluid throttling element positioned between the input and the output of the trap, the throttling element having a plurality of resistive fluid flow passages;

inlet and outlet passageways respectively connecting the fluid throttling element to the input and the output of the trap;

a cylinder formed in the steam trap and located adjacent to the throttling element;

a control piston positioned in the cylinder, the cylinder is pressurized at one end portion by the fluid flowing between the first orifice and the second orifice wherein the fluid pressure between the orifices is applied to one end portion of the control piston, and the other end portion of the cylinder is connected to the trap output wherein the output fluid pressure is applied to the other end portion of the control piston; and

an elongated valve plug positioned within the throttling element for movement between an open and a closed position wherein one end portion of the valve plug is connected to the control piston, and the other end portion of the valve plug communicates with the inlet passageway for applying the inlet fluid pressure to said other end portion of the valve plug to urge the valve plug toward an open position wherein the fluid flow through the resistive fluid flow passages is increased.

4,296,772

NON-RETURN VALVE

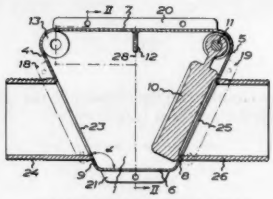
Robert Nilsson, Bromölla, Sweden, assignor to Evak Sanitar AB, Bromöolla, Sweden

Filed Jan. 23, 1980, Ser. No. 114,773

Claims priority, application Sweden, Feb. 2, 1979, 7900925

Int. Cl.³ F16K *17/12*

U.S. Cl. 137—269.5 **5 Claims**



1. A reversible flap-type non-return valve comprising

a valve housing with two through-flow openings substantially facing each other, said valve housing minimizing its interior volume and having in a first plane the basic cross-sectional form of a trapezoid, the parallel sides of said trapezoid being lower and upper transverse sides of said housing and the non-parallel sides of said trapezoid being transverse sides of the housing including said openings;

a removable inspection cover forming one side of said housing being substantially plane and disposed substantially parallel to said first plane;

bearing means attached to the valve housing defining two turning axes perpendicular to said first plane and including two pairs of bearing bushings, each pair having a fixed position one for each of said turning axes and one bearing bushing of each pair being at least in part in said removable inspection cover; and

a movable valve flap disposed at one of the turning axes of the bearing means and suitable as a closing member at both of the two through-flow openings.

4,296,773

HYDRAULIC SELECTOR VALVE HAVING JOY STICK CONTROL

Ronald W. Harshman, Greencastle, and Lynn A. Dietrich, Chambersburg, both of Pa., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

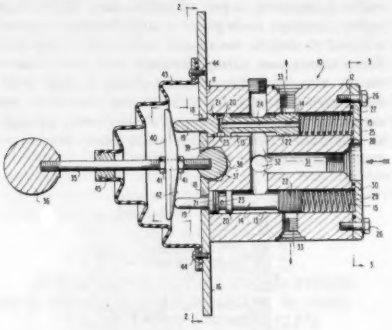
Filed Feb. 12, 1979, Ser. No. 11,762

Int. Cl.³ F16K *29/00*

U.S. Cl. 137—312 **3 Claims**

1. A selector valve comprising a valve body having plural spaced parallel bores, motive fluid inlet passage means leading to said bores and plural motive fluid delivery ports corresponding in number to said bores and leading from the bores, a valve spool positioned in each said bore of the valve body and being biased to a closing position in relation to the adjacent delivery port and having an extension projecting exteriorly of the valve body at one end thereof, a joy stick controller for said valve spools and having a universal swiveled connection with the valve body at said one end and between said bores, an end cover plate for the valve body at the end thereof remote from said joy stick controller and having an annular collector recess in its interior face in registration with said bores, said cover plate having a drain port in communication with said collector recess, and an actuating disc mounted on said joy stick controller and cammingly engaging all of said valve spool extensions

and movable with the joy stick controller to selectively shift a single valve spool or a pair of such spools to an open position



in relation to a single delivery port or a pair of such ports of the valve body.

4,296,774

DEVICE FOR DETACHABLY COUPLING THE ORIFICE OF A BRANCHLINE TO A LINE CARRYING A PRESSURE MEDIUM

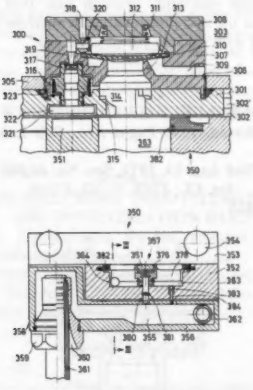
Bruno Kägi, Meilen; Georg Hirmann, Zurich, and Rolf Luginbühl, Küsnacht, all of Switzerland, assignors to Bachofen AG., Uster, Switzerland

Filed Aug. 22, 1979, Ser. No. 68,614

Claims priority, application Switzerland, Aug. 25, 1978, 9003/78; Apr. 17, 1979, 3595/79; Jul. 20, 1979, 6788/79

Int. Cl.[3] F16L *29/00, 37/28*

U.S. Cl. 137—322 **20 Claims**



1. A device for detachably coupling an orifice of a branchline to a conduit carrying a pressure medium and having a plurality of discharge valves disposed spaced apart from each other along said conduit, each of said valves having a discharge opening, and a closing element as well as opening means for each of said openings, each of said discharge valves including an expansible chamber for receiving the pressure medium therein for maintaining said closing element in a position to close the respective openings, a coupling device having said orifice disposed therein, said coupling device being longitudinally displaceable along said conduit and connectable with the conduit by opening one of the discharge valves, said coupling device being guided along said conduit and having sealing and coupling means becoming effective automatically in the coupling position with the discharge opening being at least partially in alignment with the orifice, and actuating means effective to open the respective one of said discharge valves magnetically via pre-control means without physically contacting the same in the coupling position of the coupling device for bleeding the expansible chamber of the respective discharge valve, said actuating means including magnetic control elements on the side of the displaceable coupling device and on the side of any of the different discharge valves such that by displacing the coupling device a selected one of the discharge valves can be opened and connected with the orifice of the branchline.

4,296,775

DEVICE FOR DETACHABLY COUPLING A BRANCHLINE TO A PRESSURE LINE

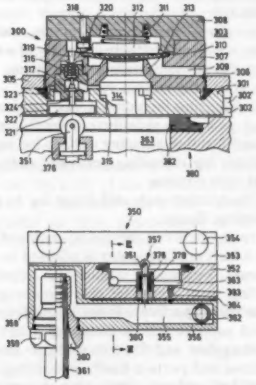
Bruno Kägi, Meilen; Georg Hirmann, Zürich, and Rolf Luginbühl, Küsnacht, all of Switzerland, assignors to Bachofen, AG., Uster, Switzerland

Filed Aug. 22, 1979, Ser. No. 68,879

Claims priority, application Switzerland, Nov. 27, 1978, 12139/78; Apr. 17, 1979, 3595/79; Jul. 20, 1979, 6788/79

Int. Cl.[3] F16L *29/00, 37/28*

U.S. Cl. 137—322 **13 Claims**



1. A device for detachably coupling an orifice of a branchline to a conduit carrying a pressure medium and having a plurality of discharge valves disposed spaced apart from each other along said conduit, each of said valves having a discharge opening, and a closing element for each of said openings, each of said discharge valves including an expansible chamber for receiving the pressure medium therein for maintaining said closing element in a position to close the respective openings, a coupling device having said orifice disposed therein, said coupling device being longitudinally displaceable along said conduit and connectable with the conduit by opening one of the discharge valves, said coupling device being guided along said conduit and having sealing and coupling means becoming effective automatically in the coupling position with the discharge opening being at least partially in alignment with the orifice, and actuating means effective to open by contact a respective one of said discharge valves in the coupling position of the coupling device, wherein said actuating means actuates the respective discharge valve indirectly via pre-control means for bleeding the expansible chamber of the respective discharge valve.

4,296,776

GATE VALVE FOR USE IN LARGE SIZE CONDUITS

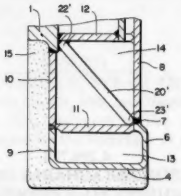
Rudolf Müller, Merzenich; Franz Lengsfeld, Julich, and Johannes Uerlichs, Woffelsbach, all of Fed. Rep. of Germany, assignors to Hermann Rappold & Co. GmbH, Duren, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,885

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909467

Int. Cl.[3] F16K *49/00*

U.S. Cl. 137—340 10 Claims



1. In a gate valve for use in large size conduits or pipe lines, particularly hot air conduits, said gate valve being of the type including a water cooled valve casing coaxially attachable to a conduit and a valve plate mounted in said valve casing for sliding movement relative thereto between open and closed positions of the conduit, the improvement wherein said valve casing comprises:

a pair of annular mounting flanges adapted to be connected to the conduit;

a pair of annular U-shaped sealing rings, each said sealing ring being positioned radially inwardly of a respective said mounting flange, said sealing rings being positioned on opposite axial sides of said valve plate;

each said sealing ring including a web portion, an inner leg extending generally radially outwardly from said web portion and forming a sealing surface for said valve plate, and an outer leg extending generally radially outwardly from said web portion;

means for connecting each said outer leg to the respective said mounting flange;

said valve casing defining therein an enclosed interior space through which cooling water is adapted to flow; and

support means, positioned within said interior space, for transmitting to at least one said mounting flange stress applied to the respective said sealing surface by said valve plate, said support means including a first end portion supported against and fixed to said one mounting flange and a second end portion freely contacting the respective said inner leg without attachment thereto, said support means having a cross-section substantially transverse to the direction of flow of cooling water within said interior space such that said support means does not appreciably interefere with or restrict such flow.

4,296,777

MULTIPLE COUPLING FOR LUBRICATING SYSTEMS

Karl Rodemer, Heidelberg, Fed. Rep. of Germany, assignor to Lincoln-Helios GmbH, Walldorf, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,843

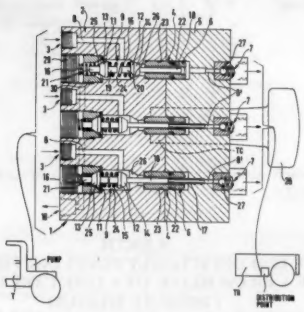
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827137

Int. Cl.[3] B60R *17/00*; F16L *29/00*

U.S. Cl. 137—351 13 Claims

13. Liquid coupling apparatus for coupling a liquid under pressure from a source to a utilization device comprising in combination,

a plug box, said plug box having means forming an inlet passageway adapted to be connected to said source of liquid, means forming a return passageway to said source of liquid, means forming an outlet passageway, a valve chamber in said plug box forming a connecting passageway between said inlet passageway, said return passageway and said outlet passageway, valve seat means formed at the entrance to each of said return passageway and said outlet passageway, a pair of piston valve elements in said valve chamber, each piston valve element assigned and adapted to seat on one of said valve seats, respectively, a first compression spring between said piston valve elements, a second compression spring biasing both said valve elements in a direction to seat the valve element associated with the valve seat at said outlet passageway, an extension member on the piston valve element associated with said outlet passageway,



a plug-in piece coupled to said utilization device and having an inlet passageway corresponding and adapted to be aligned with said outlet passageway, a valve actuator member forming an extension of said plug-in piece at said inlet passageway and adapted, when said plug-in piece is mated with said plug box, to engage said extension member and unseat the valve element associated with said outlet valve seat and, through said first compression spring, seat the said piston valve element on the valve seat associated with said return passageway.

4,296,778

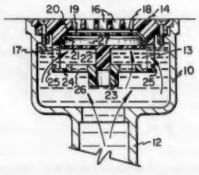
ANTI-BACKFLOW VALVE FOR SEWER TRAPS

Alonzo B. Anderson, 1238 Pagos Ave., Salt Lake City, Utah 84117

Filed Aug. 13, 1979, Ser. No. 66,088

Int. Cl.[3] F16K *31/22, 33/00*

U.S. Cl. 137—433 6 Claims



1. An anti-backflow valve for installation in a sewer catch basin, comprising in combination:

a valve housing having an upper cover plate for attachment to a catch basin and an open lower end; said valve housing being adapted for mounting within a catch basin; said valve housing having first fluid flow apertures therein;

an upper sealing seat means disposed within the upper end of said valve housing;

a bouyant sealing member reciprocatingly disposed within said valve housing for vertical movement and having means for sealing upwardly against said upper sealing seat to shut-off fluid flow through said first apertures, said

sealing member having a downwardly extending elongate guide member attached thereto;

a detachable bottom plate means for mounting on the bottom side of said valve housing, said bottom plate means includes second fluid flow apertures for permitting fluid flow therethrough in an upward direction to move said sealing member against said sealing seat means to shut-off fluid flow through said first apertures and to prevent upward fluid flow simultaneously, and when said sealing member moves downwardly said first apertures are open to fluid therethrough and the second apertures are closed to upward fluid therethrough by said sealing member, and said bottom plate means having a guide way member for receiving and reciprocatingly holding said guide member of said sealing member.

4,296,779

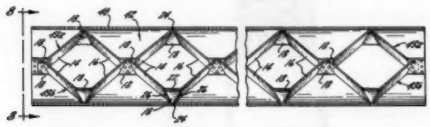
TU[illegible]'LATOR WITH GANGED STRIPS

Ronald H. S[illegible], 745 Chapel St., Ottawa, Ill. 61350

[illegible]iled Oct. 9, 1979, Ser. No. 82,576

Int. Cl.[3] B01F *15/06*; F15D *1/02*

U.S. Cl. 138—38 **10 Claims**



1. An improved turbulator unit for insertion in a heat exchanger tube having substantially straight longitudinal internal walls, comprising, in combination, a plurality of elongated turbulator strips of metal each formed of a series of alternately angling and oppositely tilting deflection panels successively joined together by substantially triangular bridging portions, said strips being ganged together with every other one of said triangular bridging portions of opposing ones of said strips being disposed and anchored substantially on the axis of the heat exchanger tube and the other ones of said triangular bridging portions of each turbulator strip disposed with the apexes thereof directed toward and adjacent the inner wall of said tube.

4,296,780

APPARATUS INCLUDING THROTTLING DEVICE FOR USE IN VENTILATION DUCT

Per Norbäch, Askrikevagen, Sweden, assignor to A. B. Carl Munters, Sollentuna, Sweden

Continuation-in-part of Ser. No. 50,519, Jun. 21, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,442

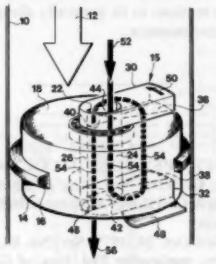
Claims priority, application Sweden, Jun. 21, 1978, 7807129; Norway, Dec. 13, 1979, 794084

Int. Cl.[3] F15D *1/02*

U.S. Cl. 138—40 **12 Claims**

1. An apparatus for use in ventilation ducts comprising a throttling device including a body having opposite air inlet and outlet sides and a plurality of fine elongated through passages extending therebetween and producing a pressure drop for conveying air flowing from said inlet through said elongated passages to said outlet side thereof, and deflector shield means mounted adjacent said inlet side of said body to allow relative movement of said body with respect thereto while cleaning the surface of said inlet side of the body, said apparatus including means for rotating one of said body and said deflector shield means relative to the other, said shield means having an opening facing said inlet side of the body which is caused to sweep over said inlet side of the body during such relative movement and means for providing flow communication between said shield means and the lower air pressure on the outlet side of the throttling device whereby the drop of pressure across the throttling device diverts a partial air flow through said shield means in another direction than the main air flow into the body of the throttling device in order to clean the surface of said inlet side of the body and then discharges said partial air flow downstream of the body in the same direction as the main air flow.

11. The combination comprising a ventilation duct and a throttling device rotatably mounted in said duct including a body having opposite air inlet and outlet sides and a plurality of fine elongated through passages extending therebetween and producing a pressure drop for conveying air flowing from said inlet through said elongaged passages to said outlet side thereof, and deflector shield means fixed in said duct adjacent



said inlet side of said body to allow relative movment of said body with respect thereto while cleaning the surface of said inlet side of the body, and means for rotating said body, said shield means having an opening facing said inlet side of the body which is caused to sweep over said inlet side of the body during rotation of the body and means for providing flow communication between said shield means and the lower air pressure on the outlet side of the throttling device whereby the drop of pressure across the throttling device diverts a partial air flow through said shield means in another direction than the main air flow into the body of the throttling device in order to clean the surface of said inlet side of the body and then discharges said partial air flow downstream of the body in the same direction as the main air flow.

4,296,781

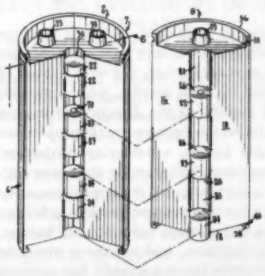
SECTIONAL PIPE AND TUBULAR MEMBERS FOR FORMING SAME

Paul G. Magnus, Apple Valley, Minn., assignor to Magnusystem, Inc., Apple Valley, Minn.

Filed Apr. 23, 1979, Ser. No. 32,249

Int. Cl.[3] F16L *9/22*; E04H *12/18*

U.S. Cl. 138—155 **16 Claims**



1. A tubular member which is elongated along a longitudinal axis extending therethrough and which is made from a plurality of sections, wherein each section has a transverse cross-sec-

tional configuration which includes a radially outward circumferential surface that defines part of the exterior of the tubular member and two generally radially extending side surfaces which converge from the radially outward circumferential surface to a radially inward circumferential surface that extends parallel to the longitudinal axis, and further including a plurality of longitudinally spaced lugs, one of said lugs located on the radially inward circumferential surface of each secton, wherein the lugs on adjacent sections are colinear with and longitudinally staggered relative to one another to interfit with one another to lock the plural sections together to form the tubular member and also to prevent relative longitudinal movement between the sections, wherein the lugs extend inwardly from the radially inward circumferential surfaces of their respective sections to lie generally along the longitudinal axis of the tubular member.

4,296,782

DOUBLE-LIFT OPEN-SHED JACQUARD MACHINE

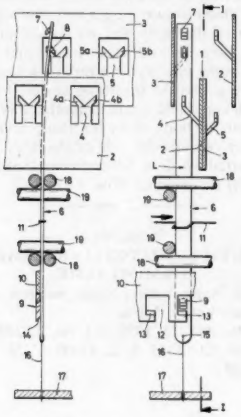
Hubert Kremer, Grefrath, Fed. Rep. of Germany, assignor to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Oct. 26, 1979, Ser. No. 88,381

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846792

Int. Cl.³ D03C *3/06, 3/30*

U.S. Cl. 139—65 **11 Claims**



1. In a double-lift open-shed Jacquard machine with two lifting bars which are movable in opposite directions relative to each other and pass each other, and with flat-bar lifters which can be controlled by main needles, whose maximum moment of resistance is parallel to the direction of movement of the main needles, and which have two main projections associated with the movable knives, a holder-up projection assoicated with a fixed upper-shed knife, and at the lower end an engagement point for a harness cord, the improvement wherein

a flat-bar lifter has two main projections, a holder-up projection and an engagement point for the harness cord, said two main projections, said holder-up projection and said engagement point lie on a straight line oriented crosswise to the direction of movement of the main needles,

said holder-up projection is positioned adjacent the flat-bar lifter in a direction transverse to the direction of movement of the main needles.

4,296,783

WEFT YARN END TREATING DEVICE FOR SHUTTLELESS LOOM

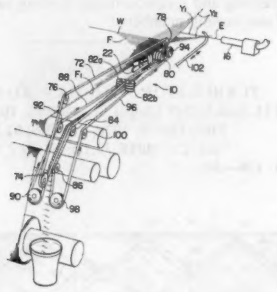
Eiji Ichimatsu, Koganei, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Nov. 29, 1978, Ser. No. 964,716

Claims priority, application Japan, Dec. 1, 1977, 52-143308

Int. Cl.³ D03D *49/70*

U.S. Cl. 139—302 **34 Claims**



1. In a shuttleless loom having yarn inserting means located adjacent a first side of the array of warp yarns from which inserting means a weft yarn is picked into the shed of the warp yarns to weave a fabric, a weft yarn end treating device for treating an end portion of the picked weft yarn which end portion is projected from a second side of the array of the warp yarns, the second side being opposite to the first side and remote away from the yarn inserting means, said weft yarn end treating device comprising:

conveying means for conveying the projected end portion of the weft yarn in a direction generally the same as the moving direction of woven fabric from a portion adjacent the weave front of a woven fabric, when the projected end portion is held to contact therewith;

holding means for holding the projected end portion to contact with said conveying means;

thrusting means for thrusting the projected end portion of the weft yarn into a location at which the projected end portion begins to be held to contact with the conveying means, said thrusting means being actuated in connection with the operation of said loom, said thrusting means including a movable rod member swingably supported on the frame of a reed of said shuttleless loom, said movable rod member including upper and lower portions which extend generally oppositely with respect to a portion at which said movable rod member is swingably supported, and a push rod member disposed stationary relative to the frame of said shuttleless loom, said push rod member being strikable against the upper portion of said movable rod member to move the lower portion of said movable rod member so as to carry the projected end portion of the weft yarn into said location; and

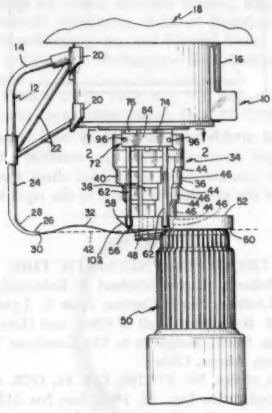
cutting means for cutting the projected end portion of the weft yarn in close proximity to a side of the fabric corresponding to the second side of the warp yarn array, after the projected end portion is thrust into said location, said cutting means being located between the fabric and said conveying means.

4,296,784

WIRE VIBRATION DAMPING DEVICE AND METHOD FOR COIL WINDING APPARATUS

Philip G. Rodenbeck, and Fredrick Koenig, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Oct. 26, 1979, Ser. No. 88,569
Int. Cl.³ H02K *15/04*
U.S. Cl. 140—92.2 **10 Claims**



1. Apparatus for forming coils of wire windings for electric motors, said apparatus comprising: a coil form support structure, a coil form adapted for having wire wound thereabout, said coil form being connected to and supported by said support structure and having a free end, flyer means rotatable about said coil form for winding turns of wire about said coil form, said flyer means having a wire discharge point from which wire is fed directly about said coil form, the discharge point rotating in a winding plane, and a wire vibration damping device having a surface at least partially encircling said coil form and which defines a plane parallel and in close proximity to the winding plane on the opposite side of the winding plane as the free end of the coil form, said surface being inside the path of rotation of said flyer.

10. In a method of forming coils of wire for electric motor windings, the method comprising generating a plurality of turns of wire about coil form means by dispensing wire thereabout and moving at least some turns of a given coil along the coil form means toward and into turn receiving means while at least one other turn for the same coil is being generated, and wherein all of the turns are generated in the same general winding plane, by a flyer arm that guides wire along a path in which the wire is caused to make a turn with respect to a center of curvature prior to exiting the arm at the wire discharge point, wherein the center of curvature is located on one side of the winding plane, the improvement comprising: interfering with oscillatory wire movement on said one side of the winding plane and thereby damping oscillations of the wire while the turns are being generated.

4,296,785

SYSTEM FOR GENERATING AND CONTAINERIZING RADIOISOTOPES

John P. Vitello, Weston, Mass., and Glenn D. Grummon, Richmond Heights, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

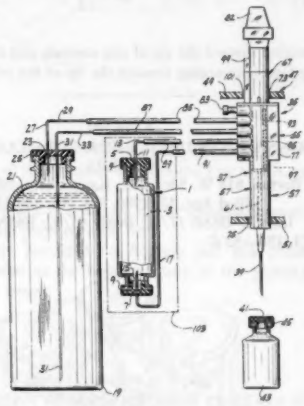
Filed Jul. 9, 1979, Ser. No. 55,784
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—105 **10 Claims**

1. A system for eluting a daughter radioisotope from a parent radioisotope and for containerizing the resultant eluate in an evacuated container having a closure adapted to be pierced by a needle, said apparatus comprising:

a generator containing a supply of the parent radioisotope, said generator having an inlet for an eluant for eluting the daughter radioisotope from the parent radioisotope and an outlet for the resultant eluate;

a reservoir for holding a supply of the eluant, said reservoir having an outlet for delivery of eluant to the inlet of the generator and an air inlet for admission to the reservoir of air from the atmosphere to apply atmospheric air pressure to eluant in the reservoir;

a tubular needle for piercing the closure of an evacuated container;



and valve means comprising a first port constituting an air inlet in communication with the atmosphere, a second port in communication with said reservoir air inlet, a third port interconnected with said reservoir outlet, a fourth port interconnected with said generator inlet, a fifth port interconnected with said generator outlet for delivery of eluate to the needle, and means for blocking communication between said first and second ports, between said third and fourth ports, and between said fifth port and the needle, and operable to place the first port in communication with the second, the third in communication with the fourth and the fifth in communication with the needle.

4,296,786

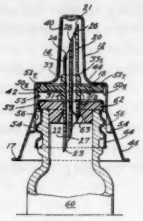
TRANSFER DEVICE FOR USE IN MIXING A PRIMARY SOLUTION AND A SECONDARY OR ADDITIVE SUBSTANCE

Dominic J. Brignola, Phoenixville, Pa., assignor to The West Company, Phoenixville, Pa.

Continuation of Ser. No. 661,869, Feb. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 333,650, Feb. 20, 1973, abandoned. This application Sep. 28, 1979, Ser. No. 79,867
Int. Cl.³ B65B *3/06*
U.S. Cl. 141—309 **32 Claims**

1. A transfer device for use in mixing substances in different containers comprising a central body portion and a pair of cannulas projecting from opposite sides of said central body portion, each of said cannulas having an outer tip portion, means defining at least one pair of transfer passages extending through said cannulas and extending the full length of said cannulas from the tip portion of one cannula to the tip portion of the other cannula, the cross sectional area of one of said transfer passages adjacent the tip of one cannula being greater than the cross sectional area of said one transfer passage adja-

cent the tip of said other cannula, each of the transfer passages being of circular cross section, one of said transfer passages converging toward the tip of one cannula and the other transfer passage converging toward the tip of the other cannula.

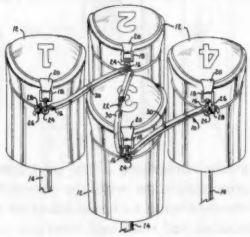


4,296,787

CONNECTION DEVICE FOR GOLF CLUB HEAD COVERS

C. D. Barton, 815 W. 53rd Ter., Kansas City, Mo. 64112

Filed Apr. 15, 1980, Ser. No. 140,439
Int. Cl.³ B65B *11/00;* **B65D** *65/02;* **B65N** *81/00*
U.S. Cl. 150—52 G **10 Claims**



1. A device for interconnecting a plurality of golf club head covers each having an eyelet, said device comprising:

an elongate flexible member extending between the eyelets of the head covers, said flexible member passing through the eyelet of each head cover to connect the head covers to one another;

means associated with opposite end portions of said flexible member for preventing the opposite end portions from passing through the eyelets located nearest the end portions; and

a plurality of tubular elements sleeved on said flexible member and extending substantially between the eyelets of the respective head covers in a manner to maintain the head covers spaced apart from one another, said tubular elements being resilient to permit flexing thereof.

4,296,788

CARRYING DEVICE

Peter G. Slater, 9 Ganung Dr., Ossining, N.Y. 10562

Filed Jun. 10, 1980, Ser. No. 158,150
Int. Cl.³ B65B *11/00;* **B65D** *65/02;* **B65N** *81/00*
U.S. Cl. 150—52 R **5 Claims**

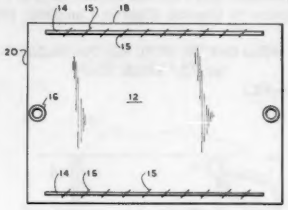
1. A flexible fabric carrier comprising:

(a) a sheet member of substantially rectangular shape,

(b) an elongated substantially rigid member adapted to be positioned along a first side portion of the sheet,

(c) supporting elements affixed to the sheet along said first side portion and adapted to receive the elongated rigid member, and

(d) attachment means at each of the end portions of the sheet not opposite said first side portion,



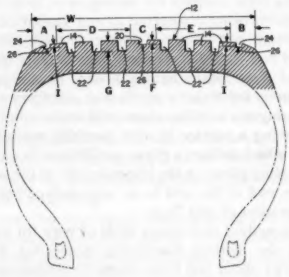
whereby said attachment means may be connected to the elongated rigid member so that any material placed on the sheet will be contained by the folded sheet formed by the connection of the attachment means to the rigid member.

4,296,789

TREAD FOR PNEUMATIC TIRE

Charles W. Roberts, Akron; Michael A. Kolowski, Tallmadge; Daniel J. Lindner, North Canton; John E. Lynch, Bedford; Terrence M. Ruip, Akron, all of Ohio, and Harold D. Fetty, Birmingham, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 877,790, Feb. 14, 1978, abandoned.
This application Dec. 11, 1980, Ser. No. 215,208
Int. Cl.³ B60C *11/10*
U.S. Cl. 152—209 R **8 Claims**



1. A pneumatic tire having a ground-engaging tread portion, said tread portion consisting of a plurality of independent buttons or projections placed circumferentially about said tire, said independent buttons or projections being spaced apart so as to provide a plurality of grooves adjacent the periphery of said buttons or projections, said grooves being sufficiently wide so as not to close up at the ground contacting surface when in the footprint of the tire, said tire characterized in that said tread is provided with a central zone and two shoulder zones which extend circumferentially about said tire, the width of said central zone and each of said shoulder zones being substantially less than the width of said tread, said central zone being located such that the longitudinal axial edges of said zone are spaced equidistant from the mid-circumferential plane of said tire, said central zone having a width ranging from 5% to 20% of the width of the tread of said tire and the depth of the recesses in between said projections in said central zone being between 25% and 60% of the depth of the recesses in between said projection in said remaining portion in between said central zone and said shoulder zones, said shoulder zones are spaced from and located axially outward from said central zone, one on either side of said central zone, and extend from each tread edge toward the mid-circumferential plane of said

tire, said shoulder zones having a width from about 5% to 20% of the width of said tread of said tire and the recesses in between said projections in said shoulder zone being from about 25% to 60% of the depth of the recesses in between said projection in said remaining portion in between said central zone and said shoulder zone.

4,296,790

LIGHT TIRE BODIES USING THICK CORDS

Yoshihiro Sakai, Kawasaki; Ryosaku Tanaka, Akigawa; Toshio Kita; Munetoshi Shimotake, both of Kodairo; Tsuguyoshi Yamada, Higashimurayama, and Hiroshi Ueda, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 17, 1979, Ser. No. 104,217
Claims priority, application Japan, Dec. 27, 1978, 53/159694
Int. Cl.³ B60C *9/06, 15/06*
U.S. Cl. 152—354 R **2 Claims**

1. A light tire body for heavy vehicles comprising, a bias-structured carcass composed of rubberized plies each including thick organic fiber cords having a cord diameter equal to or larger than that of nylon 1,890 d/2, rubber interposed between said carcass plies having a thickness corresponding to $hm/ho \leqq 0.5$ where, hm is an average rubber gauge between said plies at a center position in the widthwise direction of the tire, and ho is a diameter of said thick cord and being prepared from a compounding recipe of at least one rubber ingredient selected from natural rubber and diene synthetic rubbers, a softener, an organic vulcanization accelerator and sulfur as well as at least 30% by weight of carbon black having an average iodine adsorption value of 40–90 mg/g and an average dibutyl phthalate absorption value of 60–140 ml/100 g, and said rubber having a dynamic modulus of elasticity at 100° C. under 2% elongation of not less than 6.0×10^7 dyne/cm^2, a dynamic loss angle the tangent of which is not more than 0.095 and a tensile strength of not less than 100 kg/cm^2 as properties after vulcanization; and said carcass being provided with an apex rubber for stiffening a turnup portion of the carcass and a ratio in the dynamic modulus of elasticity of said apex rubber to said rubber interposed between the plies is within a range of 0.9–1.3.

4,296,791

FOLDING DOOR OR LIKE CLOSURE DEVICE

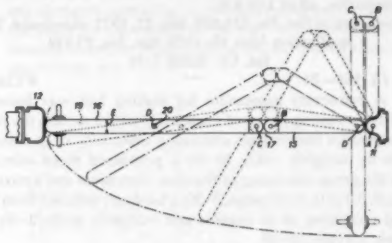
Bernard Chaumat, 10 Bd. Jourdan, 75014 Paris; Georges Gallet, 6 rue du 11 Novembre, 95110 Sannois; Jacques Lamare, 21 Bd. Richard Wallace, 92200 Neuilly-sur-Seine, and Guy Peyssard, 30 rue Raze, 33000 Bordeaux, all of France

Filed Jan. 22, 1980, Ser. No. 114,429
Claims priority, application France, Jan. 25, 1979, 79 01931
Int. Cl.³ E05D *15/26*
U.S. Cl. 160—206 **9 Claims**

1. A door or like closure device, comprising a fixed frame, a primary panel pivoted about a first axis A on the frame and at least one secondary panel connected to the primary panel by a link articulated by a second axis B to the primary panel and a third axis C to the secondary panel, said secondary panel being in addition guided at a fourth axis D in a slide guide extending perpendicular to the first axis A, and wherein:

(i) the four axes A, B, C, and D are disposed in the centre of the thickness of the panels;

(ii) the distance between the second axis B and the third axis C is equal to the thickness of the panels;



(iii) the distance between the third axis C and the fourth axis D is equal to the distance between the first axis A and the second axis B;

(iv) the fourth axis D is carried by the secondary panel at an intermediate point thereof; and

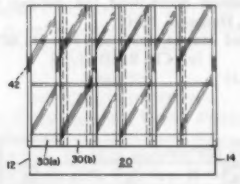
(v) means are provided for holding said link constantly perpendicular to the bisector plane of the primary and secondary panels.

4,296,792

TRANSPARENT REACH-THROUGH CURTAIN FOR OPEN REFRIGERATORS

Kenneth N. Gidge, Nashua, N.H., and Henry J. Richard, Lowell, Mass., assignors to BSL Corporation, Nashua, N.H.

Filed Feb. 5, 1979, Ser. No. 9,049
Int. Cl.³ A47H *1/00*
U.S. Cl. 160—332 **6 Claims**



1. A reach-through curtain for use over the opening in an open display type refrigerator or the like, comprising

(a) a plurality of elongated, flexible, transparent, imperforate panels of generally rectangular outline each connectable at least at one end to said refrigerator proximate to an edge of said opening,

(b) said panels extending in parallel, overlapped relation across said opening and defining slit access means between adjacent panels,

(c) each of said panels being of a length sufficient to span said opening in one direction,

(d) said panels being of a sufficient number and width to span said opening in another direction perpendicular to said one direction,

(e) the long edges of each of said panels being tubular, and,

(f) a colored, relatively short sleeve mounted in each tubular edge of said panel for visibly enhancing the access joints between adjacent panels and for reinforcing the tubular shape of the long edges.

4,296,793

REFRACTORY SUSPENSION FOR MAKING FOUNDRY MOULDS

Konstantin K. Yasinsky, ulitsa Spartakovskaya, 18, kv. 52; Sergei G. Glazunov, Leninsky prospekt, 41, kv. 62, both of Moscow; Jury N. Ross, ulitsa Patrioticheskaya, 74, kv. 36, and Igor D. Bykov, ulitsa Turgeneva, 44, kv. 6, both of Zaporozhie, all of U.S.S.R.

Continuation of Ser. No. 835,689, Sep. 22, 1977, abandoned. This application May 10, 1979, Ser. No. 37,839
Int. Cl.[3] B28B *7/36*
U.S. Cl. 164—24 9 Claims

1. A refractory suspension for making lost wax foundry moulds for casting pieces of chemically-active metals, the ratio of suspension constituents consisting essentially of as follows (parts by weight): coke, 10–60; a powdereti metal selected from the group consisting of titanium, zirconium and a mixture thereof, 0.3–5.0; resol resins, 5–50; a hardener selected from the group consisting of an organic and inorganic acids, 2–30; an organic solvent, 20–60.

8. A method for making lost wax foundry moulds comprising the steps of:

(a) forming a suspension consisting essentially, in percent by weight, of coke, 10–60; a powdered metal selected from the group consisting of titanium, zirconium, and mixtures thereof, 0.3–5.0; resol resins, 5–50; a hardener selected from the group consisting of organic and inorganic acids, 2–30; and an organic solvent, 20–60;

(b) providing a wax pattern;

(c) coating the pattern with the suspension at least four times, and sprinkling said pattern with powdered coke;

(d) drying the coating to obtain a rigid mould;

(e) melting the wax pattern from its rigid mould; and

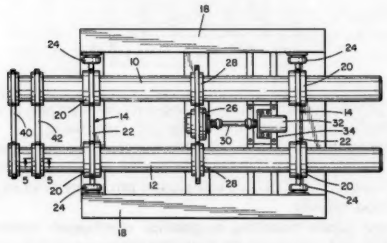
(f) curing the mould by heating to about 1300°–1350° C.

4,296,794

METHOD OF TRANSMISSION OF SONIC ENERGY TO WORK PIECES

Raymond M. Leliaert, South Bend, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Jan. 14, 1980, Ser. No. 111,487
Int. Cl.[3] B22D *29/00*
U.S. Cl. 164—131 3 Claims



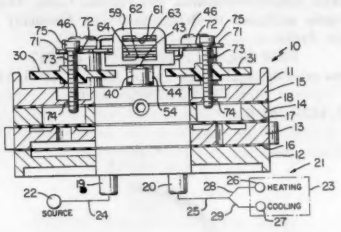
1. A method for transmitting vibratory energy to a part from a vibratory member adapted to vibrate at sonic frequency comprising securing a fixture to said vibratory member, said fixture having spaced abutment surfaces, inserting the part into the fixture to between said abutment surfaces whereby the clearance between one abutment surface and the adjacent surface of the work piece, while the work piece is at rest on the other abutment surface, is within the range of ±50% of the amplitude of the vibrations at the point of attachment of the fixture to the vibration generator.

4,296,795

PNEUMATICALLY OPERATED CONTROL SYSTEM AND UNIT THEREFOR AND METHODS OF MAKING THE SAME

Jay L. Lewis, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 2, 1980, Ser. No. 146,337
Int. Cl.[3] F25B *29/00*
U.S. Cl. 165—27 40 Claims



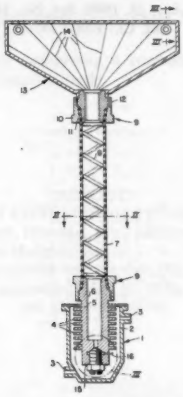
1. In a pneumatically operated system having control means provided with a single inlet interconnected to a one pressure level pneumatic source and having outlet means interconnected to pneumatically operated heating and cooling heat exchanger means to control the same in either its heating mode or its cooling mode in relation to the pressure value of the pneumatic signal means being directed thereto from said control means through said outlet means thereof, said control means having temperature sensing means for controlling said value of said signal means in relation to the sensed output temperature effect of said heat exchanger means by operating bleed means of said control means, the improvement wherein said outlet means comprises a single outlet and said bleed means comprises a single bleed device having an arrangement of parts thereof that is the same regardless of whether said heat exchanger means is operating in its heating mode or in its cooling mode whereby said heat exchanger means is adapted to be operated in either its heating mode or its cooling mode by said single bleed device without changing said arrangement of said parts of said bleed means.

2. In a pneumatically operated system having control means provided with a single inlet interconnected to a one pressure level pneumatic source and having outlet means interconnected to pneumatically operated heating and cooling heat exchanger means to control the same in either its heating mode or its cooling mode in relation to the pressure value of the pneumatic signal means being directed thereto from said control means through said outlet means thereof, said control means having temperature sensing means for controlling said value of said signal means in relation to the sensed output temperature effect of said heat exchanger means by operating bleed means of said control means, the improvement wherein said outlet means comprises a single outlet and said bleed means comprises a single bleed device whereby said heat exchanger means is adapted to be operated in either its heating mode or its cooling mode by said single bleed device, said sensing means having means providing a "dead band" temperature range so that said bleed device will remain in a certain condition thereof to provide said signal means with a certain value as long as said sensed output temperature effect falls within said "dead band" temperature range.

4,296,796
HEAT TRANSFER SYSTEM

Helmut Wulf, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1979, Ser. No. 70,505
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841051
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—46 **6 Claims**



1. A heat transfer system for transferring heat between a heat-emitting means and a heat-consuming means in accordance with a heat pipe principle, characterized in that a vacuum-tight hose conduit means is arranged between the heat-emitting means and the heat-transfer means for communicating the respective means with each other, a longitudinally-extending groove structure is disposed interiorly of the hose conduit means for supporting the hose conduit means against excessive external pressure and for providing an internal capillary structure, and in that a threaded connection means is provided for connecting respective ends of the hose conduit means into a heat transfer path.

4,296,797
RIGID SHELL FOR BUILDING STRUCTURES

George R. Beggs, 602 S. Tejon, Colorado Springs, Colo. 80903

Filed Dec. 6, 1979, Ser. No. 100,954
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—48 S **8 Claims**

1. A rigid shell for a building structure, which comprises:

(a) a pair of rigid, vertical supporting frames disposed parallel to and spaced from one another by a distance equal to the length of the shell, each of the frames comprising:

(1) a pair of spaced, horizontally disposed load-bearing elements and

(2) a pair of spaced, vertically disposed load-bearing members integral with and secured to the pair of horizontal elements at points spaced from the ends of said elements by from ⅛th to ¼th their respective lengths;

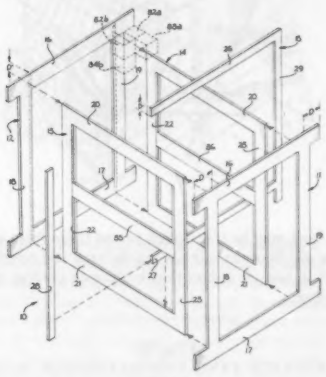
(b) a second pair of rigid, vertical supporting frame disposed parallel to and spaced from one another widthwise of the shell and at right angles to the first pair of supporting frames, each of the second pair of frames comprising:

(1) a second pair of spaced, horizontally disposed load-bearing elements and

(2) a second pair of spaced, vertically disposed load-bearing members integral with and secured to the second pair of horizontal elements, said members abutting the vertical load-bearing members of the first pair of supporting frames and being secured thereto along substantially their entire length to define four vertically disposed, load-bearing columns for the shell;

(c) a plurality of further rigid, vertical supporting frames in spaced relation lengthwise of the shell, intermediate and parallel to the first pair of supporting frames, each of the plurality of frames comprising:

(1) a third pair of spaced, horizontally disposed load-bearing elements extending across and being supported by the respective members of the pair of horizontal load-bearing elements of each of the second pair of supporting frames, and



(2) a third pair of spaced, vertically disposed load-bearing members integral with and secured to the third pair of horizontal elements;

the plurality of further supporting frames being supported by the first and second pairs of supporting frames and, in turn, providing the structural support for the side walls, roof and floor of the building structure defined by said shell; and

(d) structurally supporting materials covering at least 20% of the side and end wall and roof surfaces defined by said shell to impart sufficient stability to resist climatic torsional and eccentric loading conditions imposed thereon.

4,296,798
INTEGRATED HOUSE

Horst Schramm, Schellingstr. 16,, D-6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,417
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750918
Int. Cl.³ F24D *5/10;* **F24J** *3/02;* **E04B** *1/70*
U.S. Cl. 165—56 **8 Claims**

6. An integrated house comprising:

an intensively insulated outside shell comprising:

intensively insulated exterior walls;

an insulated roof attached to and disposed above said exterior walls;

an insulated cellar attached to and disposed below said exterior walls; and

at least one window located on said exterior walls and each of which comprise:

two panes;

a window frame spacing apart and holding said panes; and

an inner and outer portion formed by said exterior wall and receiving said window frame in sealed-together relationship; and

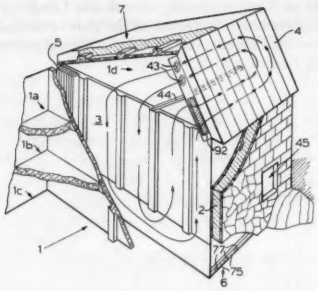
a plurality of connected interior walls and floors, forming a structure which is attached to and surrounded by said outer shell, and comprising:

two ribbed, pre-formed concrete slabs, interpositioned in

order to have hollow spaces therebetween, said interior walls and floors arranged in order to integrate said hollow spaces and form air circuits;

a heating means connected to said air circuits; and

a cooling means connected to said air circuits,



whereby heat may be transferred to and taken from said interior walls and floors via air passing through said interior walls and floors in said air circuit thus heating or cooling said integrated house.

4,296,799

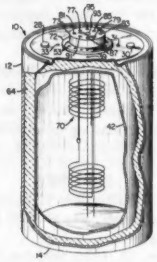
SOLAR WATER TANK AND METHOD OF MAKING SAME

Richard S. Steele, 897 E. 12th Ave., Broomfield, Colo. 80020

Filed May 29, 1979, Ser. No. 43,131

Int. Cl.³ F28D *1/06*

U.S. Cl. 165—74 **26 Claims**



1. A water tank adapted for solar heating systems, comprising:

an insulated rigid shell enclosing a chamber therein adapted for containing a fluid medium, said shell having an access hole therein, including a flexible plastic liner positioned within said chamber around the periphery thereof a spaced distance inwardly from said shell, and a foam insulation material uniformly filling the space between said shell and said liner;

an insulated cover for said access hole adapted to be positioned over said access hole and to be removably attached in that position to said shell;

a flow systems assembly extending through and attached to said cover, said flow systems assembly including fluid inlet and outlet tubes and water inlet and outlet tubes for conducting the flow of fluids and water, respectively, into and out of said chamber, and heat exchanger means for facilitating heat transfer from the fluid to the water within said chamber; and

attachment means on said cover and said shell for removably attaching said cover to said shell over said access hole with said flow systems assembly extending therethrough and positioned inside said shell.

4,296,800

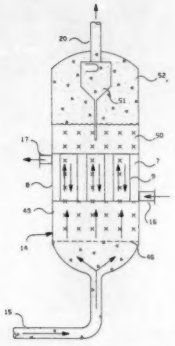
WASTE HEAT RECOVERY

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1980, Ser. No. 141,502

Int. Cl.³ F28D *13/00*

U.S. Cl. 165—95 **3 Claims**



1. A fluidized bed shell-tube heat exchange vessel adapted to recover heat from or transfer heat to gas streams containing suspended light solids flowing upwardly through a multiplicity of vertically disposed tubes on the tube side of said exchanger to a fluid flowing through the shell side of said exchanger, said tubes containing particulate heat exchange solids, said solids being maintained as a fixed fluidized bed of solids within each of said tubes by the upward flow through said tubes of said fluid containing light suspended solids which comprises, in combination:

(a) an elongated substantially vertical vessel having an inlet conduit connected to a lower portion and an outlet conduit connected to an upper portion of said vessel,

(b) a grid or distributor plate in the lower portion of said vessel adapted to support a bed of particulate solids above said grid and allow gas to pass into said bed of particulate solids,

(c) a fixed bed of particulate fluidizable solids extending a substantial distance above said grid into an intermediate portion of said vessel,

(d) a shell-tube heat exchanger section having a plurality of tubes positioned within said vessel above said grid but below the top of said fixed bed of solids with the tubes being substantially vertical and all being filled with said particulate solids and in open communication with the inlet and outlet conduits so that the heat exchange fluid passing through the shell side can absorb heat from or transfer heat to a gas stream containing entrained solids passing through the tubes containing said particulate solids, said tubes in said shell-tube heat exchanger being so sized as to be of a diameter of at least one foot and sufficient height to diameter ratio to allow recirculation of the particulate solids within each tube to maintain the inner peripheries of the tubes substantially freed from deposits to permit efficient heat exchange, and

(e) a gas-solids separator positioned within an upper portion of said vessel connected to said outlet conduit and adapted to separate entrained particulate solids from the gas stream exiting said vessel and return same to said bed.

4,296,801

REUSABLE HEAT DEVICES CONTAINING XYLITOL AS THE HEAT-STORAGE MATERIAL

Woldemar Guex, 4 Spechtweg, Bottmingen; Heinrich Klaeui, 77 Kilchgrundstrasse, Riehen; Horst Pauling, 39 Ruchholzstrasse, Bottmingen, and Felix Voirol, 26 Poolstrasse, Füllinsdorf, all of Switzerland

Continuation of Ser. No. 916,242, Jun. 16, 1978, abandoned. This application May 20, 1980, Ser. No. 151,568

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1977, 2747664

Int. Cl.[3] F28D *13/00*; F24H *7/00*

U.S. Cl. 165—104.17 6 Claims

1. A heat device comprising a container having therein xylitol as a heat-storage material.

4,296,802

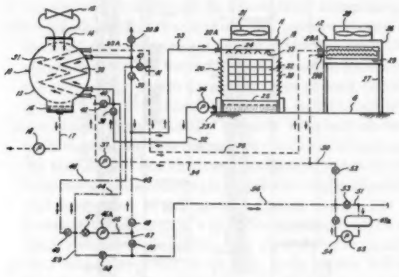
STEAM CONDENSING APPARATUS

Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 585,951, Jun. 16, 1975, abandoned. This application May 28, 1976, Ser. No. 690,883

Int. Cl.[3] F28B *9/06*

U.S. Cl. 165—110 4 Claims



1. Apparatus for use in condensing steam from the turbine exhaust of a power plant or the like, comprising a steam condenser having inlet means for receiving steam from the turbine exhaust, hot well means to receive condensed steam, and outlet means for returning condensate from the hot well to the power cycle, cooling tower means having a wet section and a dry section, the wet tower section having an inlet to receive a first cooling medium, an outlet for discharging the first medium, and means for cooling the first medium with ambient air as it passes from the inlet to the outlet, the dry tower section having an inlet to receive a second cooling medium, an outlet for discharging the second medium, and means for cooling the second medium with ambient air as it passes from the inlet to the outlet, means for circulating the first medium from the outlet from the wet cooling tower section into and through tubes within the condenser and then returning it to the inlet to said wet cooling tower section, means for circulating the second medium from the outlet from the dry cooling tower section into and through the condenser and then returning it to the inlet to said dry cooling tower section, means for interrupting the circulation of said first medium between said wet tower section and said condenser tubes, means for emptying said first medium from the tubes and then filling said tubes with the second medium, when such circulation is interrupted, and means for emptying the second medium from the tubes and then refilling the tubes with the first medium, whereby circulation of said first medium between said wet tower section and said condenser tubes may be resumed.

4,296,803

PLATE USED IN CONDENSER

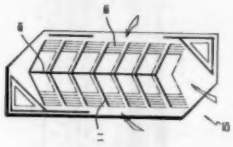
Hiroyuki Sumitomo, Osaka, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan

Continuation of Ser. No. 927,689, Jul. 25, 1978, Pat. No. 4,228,850. This application Nov. 14, 1979, Ser. No. 93,983

Claims priority, application Japan, Nov. 8, 1977, 52-134254

Int. Cl.[3] F28B *9/08*; F28D *9/02*; F28F *3/08*

U.S. Cl. 165—110 1 Claim



1. A plate for use in a condenser for condensing a vapor to a condensate, said plate having a surface and including condensate collecting and discharging elements, said vapor and said condensate flowing downwardly through the condenser, said condensate collecting and discharging elements comprising a plurality of V-shaped inclined grooves downwardly sloped towards a central portion of said plate, and a single vertical groove formed along said central portion of said plate connecting with a lowest portion of each of said inclined grooves, said vertical groove having an axis, each of said inclined grooves having a pair of edges comprising a first edge and a second edge at the intersection of said inclined groove and the vertical groove, each pair of edges being in a single plane perpendicular to the plane of the surface of said plate and perpendicular to the axis of the vertical groove, wherein said inclined grooves form ramps leading to said vertical groove and said vertical groove forms a recessed channel, the direction of flow of said condensate substantially coinciding with the direction of flow of said vapor across the entire surface of the plate, whereby said inclined grooves and said vertical groove minimizes the area of a filmy downflow liquid layer and prevents a film from growing too thick, thereby improving the heat transfer surface of said plate.

4,296,804

CORROSION RESISTANT HEAT EXCHANGER ELEMENT AND METHOD OF MANUFACTURE

Irving D. Press, West Orange; Harvey R. Nickerson, Roseland, and Helm Rink, North Haledon, all of N.J., assignors to Resistoflex Corporation, N.J.

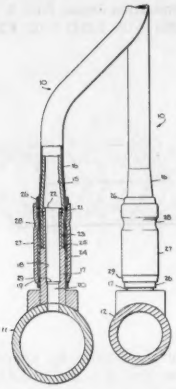
Filed Jun. 28, 1979, Ser. No. 52,759

Int. Cl.[3] F28F *9/16, 19/04*

U.S. Cl. 165—133 12 Claims

1. A heat exchanger element for use in a corrosive environment comprising a metal tube jacketed at least over a substantial portion of its length including at least one end with an extruded layer of a given fluorocarbon resin having a thickness within the limits affording efficient heat transfer combined with resistance to corrosion of said tube, said given resin being of the type which has a high viscosity in the melt stage, a nipple of corrosion resistant metal, said nipple having a first end with a circumferential shoulder thereat and an axial region adjacent said shoulder which region has a lesser diameter than said shoulder providing an undercut annular groove therebehind, said first end of said nipple being telescopingly engaged within said one end of said metal tube, and said nipple having an opposite end which projects from said one end of said metal tube, a sleeve of fluorocarbon resin surrounding said one end of said metal tube and at least a portion of said opposite end of

said nipple, said sleeve extending over said metal tube and its jacket layer of resin to a point beyond the location of said nipple shoulder, and a corrosion resistant metal ferrule surrounding said sleeve of resin and being substantially coextensive therewith, said ferrule being contracted radially squeezing



said metal tube within said axial region behind said nipple shoulder thereby effecting interlocking engagement between said metal tube and said nipple and establishing a fluid-tight seal between said ferrule, said nipple, said metal tube and the intervening resin material.

4,296,805

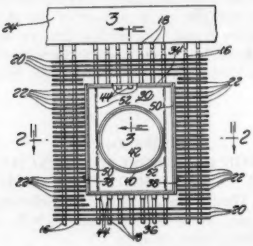
ACCESSORY CLEARANCE HOLE

James C. Fleury, Ora, Ind., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 17, 1979, Ser. No. 104,588

Int. Cl.[3] **F28D** *1/04*

U.S. Cl. 165—151 **10 Claims**



1. A heat exchanger assembly comprising; a core having front and rear faces and including tubes parallel to said faces and fins extending transversely to said faces and said tubes respectively and interconnecting said tubes, a group of said tubes and a first plurality of said fins defining an opening extending between said faces along the lengths thereof and between the opposite ends of said tubes and said fins, said opening being defined by each of said tubes in said group being devoid of a length thereof so that each of said tubes in said group has spaced first and second open ends and each of said fins in said first plurality being devoid of a length thereof so that each of said fins in said plurality has spaced ends, a single tank in fluid communication with said first and second ends to establish fluid communication therebetween, said tank having front and rear walls disposed adjacent said front and rear faces respectively of said core and a peripheral wall extending about said opening and interconnecting said front and rear walls to define an enclosed volume within said tank, and a tubular member extending through said volume between said front and rear walls and in spaced relationship to said peripheral wall for defining a clearance hole allowing access through said core between the opposite faces thereof, said peripheral wall including a plurality of ferrules integral therewith with each ferrule surrounding and in sealing engagement with one of said first and second ends of said group of tubes said peripheral wall including top and bottom walls and said ferrules extending from said top and bottom walls in the same direction.

4,296,806

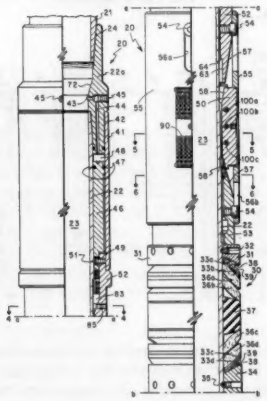
HIGH TEMPERATURE WELL PACKER

Donald F. Taylor, Dallas, and James H. Bostock, Denton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 5, 1979, Ser. No. 82,406

Int. Cl.[3] **E21B** *33/128, 33/129;* **F16J** *15/12, 15/14*

U.S. Cl. 166—120 **22 Claims**



11. In a packer for forming a seal with the inner wall of a casing string and having a sealing unit carried on a mandrel means, the sealing unit comprising:

a. each end element having a partially elliptical cross section with parallel cylindrical inside and outside diameters;

b. the major axis of the partially elliptical cross sections forming an acute angle with the exterior of the mandrel means when the sealing unit is in its first position; and

c. the major axis moving towards a position normal to the mandrel means when the sealing unit is in its second position.

17. In a well packer, for sealing between the outside diameter of a tubing string and the inside diameter of a casing string disposed within a well bore, the sealing unit, carried on the exterior of a mandrel means, comprising a center element, end elements, and backup rings wherein:

a. the center element is selected from the group consisting of ethlene propylene-diene terpolymer, vinylidene fluoride and hexafluoropropylene copolymer, and polytetrafluoroethylene; and

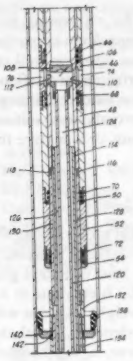
b. the end elements are selected from the group consisting of vinylidene fluoride, hexafluoropropylene copolymer, asbestos, graphite, and ceramic fibers with each being reinforced by wire mesh.

4,296,807

CROSSOVER TOOL

James D. Hendrickson, Carrollton, and Pat M. White, Lewisville, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 27, 1979, Ser. No. 107,752
Int. Cl.[3] E21B *33/124*
U.S. Cl. 166—184 23 Claims



1. A crossover tool for use in a well bore, comprising:

body means having first and second passage means therethrough, said first passage means extending from the top of said body to the bottom thereof at a first location, said second passage means extending from at least one side of said body to the bottom thereof at a second location;

sleeve means longitudinally slidably disposed about said body means, said first passage means communicating with the bore of said sleeve means, said sleeve means having at least one port therethrough circumferentially aligned with said side extent of said second passage means and being juxtaposed therewith in a first sleeve position and longitudinally removed therefrom in a second sleeve position;

packer means disposed about said body means below the lowest point of longitudinal travel of said sleeve means;

selectively closeable bypass passage means in said body means extending from the outside of said body means above said packer means to the outside of said body means below said packer means; and

selection means to select each of said positions in response to longitudinal movement of said sleeve means.

4,296,808

ISOLATION PACKER EXTENSION

Eugene E. Baker, and Ernest E. Carter, Jr., both of Duncan, Okla., assignors to Halliburton Services, Duncan, Okla.

Division of Ser. No. 958,706, Nov. 8, 1978. This application Aug. 4, 1980, Ser. No. 174,820
Int. Cl.[3] E21B *33/124*
U.S. Cl. 166—191 5 Claims

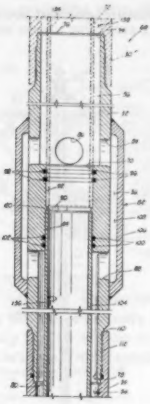
1. An isolation packer extension, comprising:

a cylindrical middle body, said middle body including an axial bore therethrough for receiving an upper inner mandrel therein, a first axial counterbore communicating with an upper end of said middle body, and a second axial counterbore communicating with a lower end of said middle body;

a bypass means, communicating said first axial counterbore with said second axial counterbore;

a spacer coupling, connected at an upper end to said middle body, said spacer coupling being constructed for connection at its lower end to a lower body, to which lower body is attached a lower packer assembly; and

a lower inner mandrel, an upper end of which is closely received in said axial bore of said middle body, and a



lower end of which is constructed to be closely received within an axial bore of said lower body.

4,296,809

IN SITU GASIFICATION OF BITUMINOUS COAL

Shirley C. Tsai, Pittsburgh; Richard H. Graham, O'Hara Township, Allegheny County, and Robin R. Oder, Export, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 21, 1980, Ser. No. 170,796
Int. Cl.[3] E21B *43/247*; E21C *43/00*
U.S. Cl. 166—259 11 Claims

1. In the underground gasification of a swellable bituminous coal by the injection of air into the high gas flow linkage between an injection hole and a production hole accompanied by the concurrent underground partial combustion and gasification of said coal, a method for pretreating and conditioning the coal proximate to said linkage before said partial combustion and gasification is initiated which comprises the step of injecting pretreating air at a temperature between about 100° C. and up to about the softening temperature of said coal into said injection hole and through said linkage to said production hole in the absence of combustion at a flow rate and for such time as will substantially reduce the swelling of said coal proximate to said linkage, whereby the gas permeability of said coal proximate to said linkage is enhanced and the plugging of said linkage in the subsequent partial combustion and gasification step is suppressed.

4,296,810

METHOD OF PRODUCING OIL FROM A FORMATION FLUID CONTAINING BOTH OIL AND WATER

Ernest H. Price, 1266 Pepper Dr., El Centro, Calif. 99243

Filed Aug. 1, 1980, Ser. No. 174,350
Int. Cl.[3] E21B *43/02, 43/38*
U.S. Cl. 166—265 6 Claims

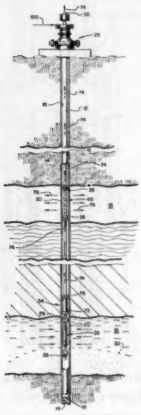
1. A method of producing oil from a formation fluid containing both oil and water comprising the steps of:

providing a production casing in a well bore traversing both a production zone and a disposal zone located at vertically spaced apart levels with respective sets of perforations connecting the interior of the production casing with the two said zones;

drawing formation fluid from the production zone through said perforations into a separator assembly disposed within said casing in the region of the production zone, causing the formation fluid to pass in contact with a sur-

face of filter medium of the separator assembly, which filter medium is permeable to one component of the formation fluid;

maintaining a pressure gradient across said filter medium; and



pumping the separated oil from one side of the filter medium to the surface and pumping the separated water from the other side of the filter medium through the production casing to said disposal region and discharging said water at said disposal level.

4,296,811

METHOD FOR PERMEABILITY CORRECTION BY IN SITU GENESIS OF MACROEMULSIONS IN HARD BRINE

Charles W. Morris, Sante Fe Springs, Calif., and Ronald E. Terry, Lawrence, Kans., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1978, Ser. No. 922,453
Int. Cl.[3] E21B *33/138, 43/22*
U.S. Cl. 166—273 **17 Claims**

1. A process for recovering oil from a subterranean oil-bearing reservoir having zones of varying permeability and containing connate water having divalent ions comprising the steps of:

(a) injecting into said reservoir through at least one injection well a surfactant system, thereby selectively plugging high permeability zones, said surfactant system comprising: water; 0.5 to 12 weight percent based on the weight of said water of a petroleum sulfonate surfactant having an average equivalent weight within the range of 375 to 500; 250 to 17,000 parts per million by weight of a predominantly sodium chloride electrolyte based on the weight of said water; and 1 to 12 weight percent based on the weight of said water of a cosurfactant selected from the group consisting of amides, amines, esters, aldehydes and ketones containing 1 to 20 carbon atoms and alcohols containing 4 to 7 carbon atoms, which cosurfactant has a solubility in water within the range of 0.5 to 20 grams per 100 grams of water, said surfactant system having less than 1 weight percent oil;

(b) thereafter injecting a secondary or tertiary oil recovery system through at least one injection well so as to displace oil toward at least one recovery well; and

(c) recovering oil from said at least one production well.

4,296,812

SURFACANT WATERFLOODING OIL RECOVERY METHOD

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 46,132, Jun. 6, 1979, abandoned. This application Dec. 21, 1979, Ser. No. 106,212
Int. Cl.[3] E21B *43/22*
U.S. Cl. 166—274 **14 Claims**

1. In a method for recovering petroleum from a subterranean, permeable, petroleum-containing earth formation penetrated by at least one injection well and by at least one production well, by a surfactant waterflooding method comprising injecting an aqueous fluid containing from 0.5 to 10.0 percent of an alklypolyalkoxyalkylene sulfonate, an alkylarylpolyalkoxyalkylene sulfonate, or a mixture thereof, having the following formula:

$$R_aO(R_a'O)_{na}R_a''SO_3^-M^+$$

wherein R_a is an alkyl group having from 6 to 24 carbon atoms, or an alkylaryl consisting of benzene, toluene or xylene having attached thereto at least one alkyl group containing from 5 to 22 carbon atoms, R_a' is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher alkylene, R_a'' is ethylene, propylene, hydroxypropylene or butylene, n_a is a number from 1 to 20, and M is sodium, potassium, lithium or ammonium, said fluid being injected into the formation via the injection well and displacing petroleum through the formation to the producing well where it is recovered to the surface of the earth, the improvement which for increasing the oil recovery effectiveness of the aqueous surfactant fluid comprises:

incorporating in the surfactant fluid, an effective amount in the range of from 10 to 1000 parts per million of silica-polydialkylsiloxane comprising silica having particle size in the range from 0.005 microns to 2.0 microns wherein the polydialkylsiloxane has the following formula:

$$HO(SiR_bR_b'O)_{nb}H$$

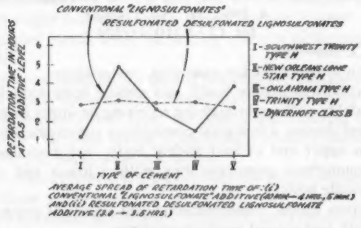
wherein R_b and R_b' are each a C_1 to C_6 alkyl, nb is a number from 1 to 2000, H is hydrogen, O is oxygen, and Si is silicon.

4,296,813

WELL CEMENTING

William J. Detroit, Schofield, and Michael E. Sanford, Wausau, both of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 671,159, Mar. 29, 1976, Pat. No. 4,065,318. This application Feb. 7, 1977, Ser. No. 766,079
Int. Cl.[3] C04B *7/02, 7/35;* C07G *1/00;* E21B *33/13*
U.S. Cl. 166—293 **18 Claims**


CONVENTIONAL "LIGNOSULFONATES"
RESULFONATED DESULFONATED LIGNOSULFONATES
RETARDATION TIME IN HOURS AT 0.5 ADDITIVE LEVEL
I - SOUTHWEST TRINITY TYPE H
II - NEW ORLEANS LONE STAR TYPE H
III - OKLAHOMA TYPE H
IV - TRINITY TYPE H
V - DYKERHOFF CLASS B
TYPE OF CEMENT

1. In the process of drilling wells and borings into the earth's surface, including the injection of a hydraulic cement mixture thereinto, the improvement that comprises including in said hydraulic cement mixture, between about 0.05 percent and

about 3 percent by weight of the resulting mixture, of a retarding agent composition for said hydraulic cement mixture that is an alkaline oxidized, hydrolyzed, partially desulfonated and subsequently resulfonated lignosulfonate, said resulfonated lignosulfonate having substituted therein as the resulfonation units, those of the formula:

$-SO_3H$,

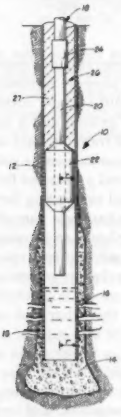
said resulfonated lignosulfonate containing, on a percent by weight basis, based on composition weight, between about 1½ weight percent and about 15 weight percent of total sulfur in combined organic sulfonic sulfonate form; said lignosulfonate prior to resulfonation having a relative molecular size of substantially 1,000 to 20,000.

4,296,814

METHOD FOR THERMALLY INSULATING WELLBORES

John L. Stalder, Ventura, Calif., and William L. Martin, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 18, 1980, Ser. No. 170,273
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—303 **23 Claims**



1. A method of thermally insulating a well bore containing a tubing string to reduce heat transfer between the well bore and surrounding formations comprising the steps of:

introducing a heat-activated gel-forming fluid having heat insulating properties when gelled between said well bore and tubing string; and

causing said gel-forming fluid to be heated and thereby gelled.

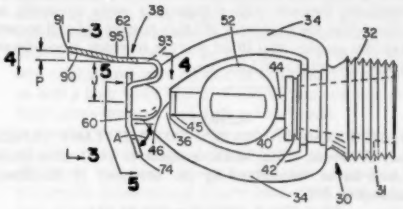
4,296,815

DEFLECTOR WITH CONVERGING LOWER TINES FOR HORIZONTAL SPRINKLER

James W. Mears, Warwick, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Cranston, R.I.

Filed Mar. 10, 1980, Ser. No. 128,818
Int. Cl.³ A62C *37/08*
U.S. Cl. 169—37 **6 Claims**

1. A fire protection sprinkler head including a throat through which a nearly horizontal stream of fire retardant fluid can flow and a deflector spaced downstream from the flow emerging out of said throat, said deflector including a generally planar confining element more nearly horizontal than vertical which is positioned above the longitudinal axis of said throat for the purpose of confining the upward trajectory of a portion of the stream and a plurality of fluid-deflecting elements positioned below the confining element for the purpose of deflecting and distributing other portions of the stream, some of said fluid-deflecting elements defining between themselves a plurality of slots extending generally outwardly from beneath said axis, at least one of said slots extending generally



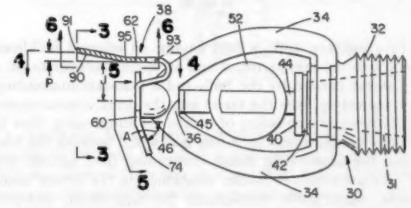
downward from said axis, the improvement wherein said downwardly-extending slot is substantially narrower in width at its outermost extremity than at an intermediate location that is closer to said axis, so as to raise the trajectory of fluid passing through said slot.

4,296,816

HORIZONTAL SPRINKLER DEFLECTOR WITH FLOW LIFTING FORMATION

Michael A. Fischer, North Kingstown, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Cranston, R.I.

Filed Mar. 10, 1980, Ser. No. 128,820
Int. Cl.³ A62C *37/08*
U.S. Cl. 169—37 **19 Claims**



1. In a fire-protection sprinkler head of the horizontal-sidewall type, including a throat through which a horizontal stream of fire-retardant fluid can flow, a deflector spaced from said throat and in the path of said stream for generating a spray into an area, said deflector including a generally planar confining element more nearly horizontal than vertical disposed above the longitudinal axis of said throat for the purpose of confining the upward trajectory of a portion of said stream and a deflector structure below said element for the purpose of deflecting and distributing other portions of said stream in various desired directions, said confining element extending generally longitudinally along the direction of said axis from an upstream end to a downstream end, a portion of said stream being incident upon the undersurface of said confining element and being caused to flow generally parallel to said under surface from said upstream end to said downstream end, the improvement wherein

said confining element is deformed upwardly along an area extending longitudinally from said downstream end to a region intermediate said upstream and downstream ends, thereby forming

an upwardly-deformed area and

generally undeformed areas laterally adjacent to said upwardly-deformed area,

the undersurface of said upwardly-deformed area being inclined upward relative to the undersurfaces of said generally undeformed areas, and

said upward inclination being chosen so that a portion of said stream entering said upwardly-deformed area is lifted upwardly from a flow direction generally parallel to the undersurface of said generally undeformed areas to a relatively upwardly inclined flow direction,

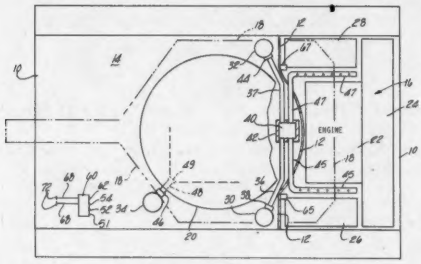
whereby the lifted portion of said stream departs from said confining element with a trajectory more upwardly inclined than the trajectory of other portions of said stream, thereby causing said lifted portion to reach more distant areas from said sprinkler head.

4,296,817

FIRE SUPPRESSION SYSTEM FOR MILITARY TANKS

Anthony J. Monte, Utica, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 5, 1979, Ser. No. 91,423
Int. Cl.³ A62C *35/12*
U.S. Cl. 169—62 **1 Claim**



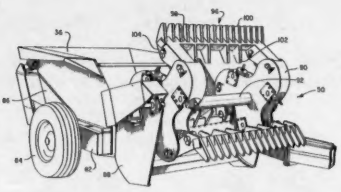
1. In a military tank, a hull having an internal bulkhead defining a driver compartment and an engine compartment, a rotary turret carried by the hull, and a man-accommodating basket depending from the turret into the drive compartment; the improvement consisting of means for suppressing fires in the engine compartment or in the hull space beneath the basket; said fire-suppressing means comprising first, second and third pressure-resistant bottles positioned in the driver compartment; vaporizable pressurized fire-suppressant charged into each bottle; first conduit means oriented to discharge first bottle suppressant into the engine compartment; a first electrically-operated valve for controlling flow through the first conduit means; second conduit means oriented to discharge second bottle suppressant into the engine compartment; a second electrically-operated valve for controlling flow through the second conduit means; third conduit means oriented to discharge third bottle suppressant into the hull space beneath the basket; a third electrically-operated valve for controlling flow thorugh the third conduit means; a cabinet located in the hull within reach of the human driver; first, second and third manual switches located in the cabinet for actuation by the driver to trigger respective ones of the valves to their open conditions; flame-responsive sensor means for detecting the occurrence of a fireball in the engine compartment; an alarm device located in the cabinet and energizable by said sensor means to alert the driver to the presence of a fire in the engine compartment; an electrical circuit operated by the sensor means to trigger at least one of the first and second valves to the open condition, whereby fires in the engine compartment can be suppressed automatically or under manual control, and fires in the hull space beneath the basket can be suppressed under manual control; fourth, fifth and sixth manual switches located within the cabinet in electrical parallelism with respective ones of the first, second and third switches; and a cable operator for each of the fourth, fifth and sixth switches; each cable operator being accessible from a point external to the hull; each of the fourth, fifth and sixth switches being a toggle switch having a lever operator; each cable operator including an apertured element (66) and a tension spring (70); each apertured element having one of its ends thereof connected to a cable and its other end connected to a spring; each spring being anchored within the aforementioned cabinet to draw the associated toggle switch to a circuit-open position.

4,296,818

ROTARY ROCK PICKER

Leon Malinowski, and Kenneth Lange, both of Yorkton, Canada, assignors to Leon's Manufacturing Co., Ltd., Saskatchewan, Canada

Filed Apr. 10, 1979, Ser. No. 28,661
Claims priority, application Canada, Jan. 16, 1979, 319699
Int. Cl.³ A01B *43/00*
U.S. Cl. 171—63 **4 Claims**



1. A rock picking apparatus comprising a mobile frame, a pair of spaced assembly support members on said frame, a fork and reel assembly on said support members of the frame for picking rocks from the ground and a dumpable stone storage bucket mounted on said frame behind said fork, said fork and reel assembly including an axle and a pair of spaced side plates at each end of the axle, and journalled for rotation in the assembly support members and supporting between them a plurality of rakes; each said rake having a pair of spaced legs pivotally mounted to said side plates; and compression spring means connecting the trailing sides of said rakes to said pairs of side plates and biasing said rakes to an operative position wherein one end of each spring means is pivotally secured to the trailing side of a rake and the other end of the spring means is supported between one of said pairs of side plates; the fork and reel assembly including a lower cross member extending between and secured to said assembly support members adjacent the lower ends thereof and a parallel, upper cross member also secured to the support members, said fork having a plurality of tines spaced along said cross members at right angles thereto to mesh with the teeth of said rakes; all of the tines being secured adjacent their lower ends to the lower cross members and alternate tines being secured adjacent their upper ends to the upper cross member.

4,296,819

CABLE TENSIONER FOR A DOWNCROWDING DEVICE FOR EARTH BORING MACHINES

Charles R. Griste, Corsicana, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed May 12, 1980, Ser. No. 147,999
Int. Cl.³ B23Q *5/027, 5/033*
U.S. Cl. 173—147 **2 Claims**

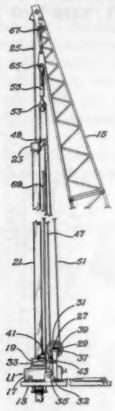
1. In an earth boring apparatus having a kelly suspended by a mast, a downcrowding device having a rotatable drum, hydraulic ram means for moving the drum downwardly, brake means for preventing rotation of the drum, and a downcrowding cable connected directly to the top of the kelly and wrapped around the drum, an improved take-up means for removing slack in the downcrowding cable when raising the drum, comprising in combination:

a take-up sheave carried below the mast;

a take-up cable wrapped around the drum and extending from the drum on a side opposite to the side that the downcrowding cable extends from, the take-up cable

being reeved over the take-up sheave and connected to the top of the kelly; and

cable tensioner means connected between the take-up sheave and the mast for allowing the take-up sheave to



move downwardly with respect to the mast as the kelly and drum move downwardly during drilling, and for urging the take-up sheave upwardly with respect to the mast to rotate the drum and take up slack as the drum is moved upwardly with the brake being released.

4,296,820

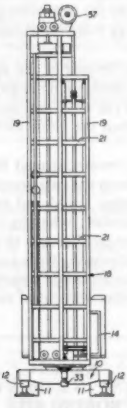
DRILLING APPARATUS

James B. Loftis, P.O. Box 38, Remlap, Ala. 35217

Filed Feb. 1, 1980, Ser. No. 117,562

Int. Cl.³ E21C *11/02*

U.S. Cl. 175—52 **19 Claims**



1. The combination with drilling apparatus having an elongated frame supporting a transmission unit for longitudinal movement therein with the transmission unit operatively connecting a longitudinally extending polygonal drive shaft to a driven head disposed to be threadedly connected to one end of an adjacent drill rod section extending in axial alignment therewith with the other end of the drill rod section being threadedly connected selectively to another drill rod section and a drill bit for drilling a hole into the earth, the improvement comprising:

(a) a drill rod rack mounted for rotation about an axis within said elongated frame and adapted to carry a plurality of angularly spaced drill rod sections with said drill rod sections being movable sequentially into axial alignment with said driven head upon rotation of said drill rod rack to selected angular positions about said axis so that as each drill rod section carried by said drill rod rack is moved into axial alignment with said driven head it is positioned to drill a hole while said drill rod section and said driven head move through said drill rod rack, and

(b) a breaker unit carried by the end of said elongated frame adjacent the hole being drilled into the earth and in axial alignment with said driven head for breaking the joint selectively between said driven head and a drill rod section, between drill rod sections and between a drill rod section and a drill bit.

4,296,821

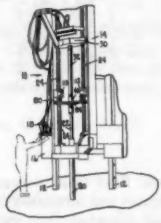
DRILLING RIG AND CONVERSION APPARATUS

Leslie Larson, P.O. Box 334, Mabel, Minn. 55954

Filed Feb. 7, 1980, Ser. No. 119,461

Int. Cl.³ E21B *4/06, 6/00, 7/20*

U.S. Cl. 175—87 **13 Claims**



1. Apparatus for converting a bottom-hole percussion drilling rig of the type including a ram adapted to apply linear force in a desired direction to a length of drill rod extending from said ram in said direction, a percussion assembly attached to said drill rod at an end opposite the end at which said drill rod extends from said ram and having a receptacle open and extending axially in the direction in which the linear force is applied, to which assembly the linear force and rotational movement about the axis with respect to which the receptacle extends are applied by said drill rod, a piston mounted within the receptacle for reciprocating axial movement, and a bit element normally disposed within the receptacle so that the piston can percussively engage an anvil portion of the element, to a top-of-the-hole rig wherein said percussion assembly is mounted to said rig proximate said ram with said receptacle open and extending axially in the direction in which said ram applies linear force, and wherein said drill rod extends generally from said percussion assembly with said bit element attached to said drill rod at an end opposite an end by which said rod extends generally from said percussion assembly, which rig can simultaneously effect hole drilling and driving of casing, enclosing said drill rod, for retaining the inner surface of the hole, comprising:

first means configured to be operatively connected to the percussion assembly and disposed within said receptacle in place of said bit element for transmitting percussive force generated by the reciprocating axial movement of the piston and the linear force of the ram to an axial end of the casing; and

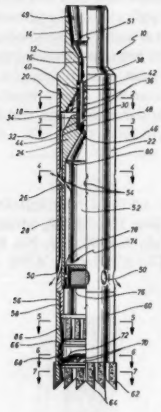
second means attached to said first means for transmitting said percussive force, the linear force of the ram, and the rotational movement to the drill rod.

4,296,822

MULTIPURPOSE FLUID FLOW ASSISTED DOWNHOLE TOOL

Ronald D. Ormsby, Woodlands, Tex., assignor to Omega Tools International, Houston, Tex.

Filed Nov. 26, 1979, Ser. No. 97,496
Int. Cl.[3] E21B 25/12
U.S. Cl. 175—249 21 Claims



1. A multipurpose fluid flow assisted downhole tool for removing metal objects and formation core samples from the bottom of wells, said downhole tool comprising:

a tubular connection sub for connecting said tool to a pipe string to be extended into a well bore:

elongated tubular housing means being secured to said connection means and defining an internal object receiving chamber, said housing means further defining fluid flow means allowing circulation of fluid from said pipe string through said connection sub and through at least a portion of said housing means, said housing means including

an outer barrel being connected at the upper extremity thereof to said tubular connection sub, said outer barrel defining velocity jet means,

an inner barrel being fixedly disposed within said outer barrel, said inner barrel defining an internal chamber and cooperating with said outer barrel to define first fluid passage means between said inner and outer barrels, said first fluid passage means being in communication with said velocity jet means, and

means for selectively directing fluid flowing through said tubular connection sub to said fluid passage means and for selectively directing fluid flowing through said tubular connection to said internal chamber;

an object receptacle being provided at the lower extremity of said housing means and defining an object receiving opening;

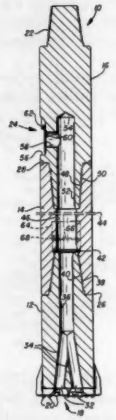
a plurality of flexible radial fingers being connected to the interior of said object receptacle and extending transversely toward the center of said object receptacle and being positioned in upwardly inclined relation, said radial fingers being sufficiently flexible in the upward direction to allow passage of an object past said fingers into said object receptacle and being sufficiently rigid in the downward direction to prevent objects from falling out of said object receptacle.

4,296,823

CABLE TOOL WITH CIRCULATING DRILL STEM

Wayne Gholson, Scottsville, Ky., assignor to Varel Manufacturing Company, Dallas, Tex.

Filed Oct. 11, 1979, Ser. No. 83,988
Int. Cl.[3] E21B 7/00, 10/36, 27/00
U.S. Cl. 175—308 18 Claims



1. In a cable tool for crushing and cutting rock and earth by a dropping action to form a well hole, the cable tool having a tool bit with a cutting face for dropping against rock and earth and having an upper tool body connected to the tool bit with an upper body end for connection to a cable for extending down the well hole, the improvement comprising:

at least one opening in the cutting face of the tool bit for receiving and removing rock and earth particles from the bottom of the well hole to facilitate the crushing and cutting of the rock and earth;

a passageway in the tool bit extending from said opening to the upper tool body for transmitting rock and earth particles upwardly away from the cutting face and the bottom of the well hole;

a retention chamber formed in the upper tool body for receiving rock and earth particles from said passageway to contain and store the rock and earth particles for subsequent removal when the cable tool is removed from the well hole; and

pressure relief drain means formed through the side of the upper tool body from the exterior thereof to the retention chamber for draining liquid and releasing pressure from said retention chamber, whereby liquid, rock and earth particles are received through the opening, transmitted through said passageway, with rock and earth particles retained within the retention chamber and liquid passing through said chamber and out of said pressure relief drain means.

4,296,824

NOZZLE PLACEMENT IN LARGE DIAMETER EARTH BORING BITS

Kerry S. Kennington, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

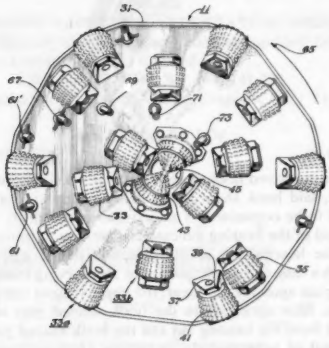
Filed Jun. 29, 1978, Ser. No. 920,561
Int. Cl.[3] E21B 10/18
U.S. Cl. 175—340 6 Claims

1. In a drill bit for drilling a borehole in the earth of the type having cutter support means, a plurality of rotatable cutters mounted to the cutter support means for cutting an annular outer zone at the periphery of the borehole and a circular inner zone bounded by the outer zone, connection means for con-

necting the cutter support means to a string of drill pipe having at least one input and one return flow passage extending from the drill bit to the surface for pumping fluid to the drill bit and returning fluid and cuttings to the surface, and an intake port in the cutter support means in communication with the return flow passage for transmitting cuttings to the return flow passage, an improved nozzle means for discharging fluid from the input passage against the borehole, comprising:

at least one outer zone nozzle mounted adjacent the periphery of the cutter support means, the outer zone nozzle being in communication with the input passage and pointed so that the center of its discharge strikes the outer zone; and

a plurality of inner zone nozzles spaced at selected points on the cutter support means and pointed so that the centers of



their discharges strike the inner zone, one of the inner zone nozzles being located near the outer zone nozzle, another inner zone nozzle near the intake port, and at least one inner zone nozzle spaced between, the outer zone nozzle and each inner zone nozzle having a nonrotating area of influence, the area of influence of the outer zone nozzle leading, being further outward, and overlapping the area of influence of the nearest inward inner zone nozzle, the area of influence of each inner zone nozzle leading, being further outward, and overlapping the area of influence of its nearest inward inner zone nozzle, the area of influence of the inner zone nozzle closest to the intake port extending below the intake port, to create a continuous stream flowing from the periphery of the borehole to the intake port.

4,296,825

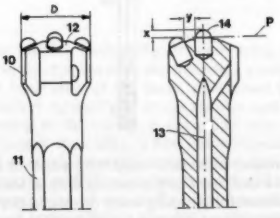
ROCK DRILL

Lars E. Larsson, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation-in-part of Ser. No. 854,752, Nov. 25, 1977, abandoned. This application Oct. 4, 1979, Ser. No. 81,785

Int. Cl.[3] **E21C** *13/01*

U.S. Cl. 175—410 **11 Claims**



1. A rock drill for percussion drilling comprising a bit body, said bit body including a front face extending generally transversely relative to the longitudinal axis of said bit body, a substantially central button insert of hard material, said central button insert extending longitudinally outwardly of said front face substantially in alignment with said longitudinal axis, and at least a first row of circumferentially spaced outer button inserts of hard material, there being more than two outer inserts disposed on more than two different radii from said axis, said outer button inserts extending outwardly of said front face and being inclined at an angle relative to said longitudinal axis and being arranged to define an outer diameter (D) of the hole drilled by the rock drill, said central and outer inserts each including a working surface disposed on the front of a mounting portion of the insert, said mounting portion being embedded along substantially all of its length within said bit body, said working surface being characterized by an absence of an edge extending radially of said longitudinal axis when viewed along said axis, the improvement wherein the ratio of Y to D is in the range of 8% to 22%, where Y is the distance between opposed side faces on said central button insert and at least one of said outer button inserts when measured at said front face, and the ratio of X to D is no greater than 20%, where X is the outward extent of the outer end of said central button insert beyond a transverse plane through the outer end of at least one of said outer button inserts.

4,296,826

VEHICLE HAVING BOGIE MOUNTED WHEELS

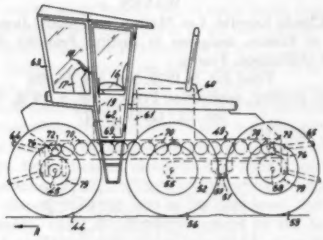
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Apr. 20, 1979, Ser. No. 32,030

Claims priority, application Netherlands, Apr. 26, 1978, 7804438

Int. Cl.[3] **B62D** *61/10*

U.S. Cl. 180—24 **10 Claims**



1. An agricultural tractor comprising a frame, an engine carried by said frame, a tractor hitching device mounted on the rear of said frame, at least three ground engaging wheels mounted on each side of said frame, said ground engaging wheels on each side being aligned one behind the other with respect to the tractor's direction of travel, a cradle frame part, said cradle frame part comprising two carrier beams which are effectively parallel to the tractor's plane of symmetry, at least two but not all of said aligned wheels on each side of said frame mounted on a corresponding said carrier beam of said cradle frame part, each said carrier beam being independently pivotable relative to said tractor frame about a substantially fixed axis extending normally relative to the tractor's plane of symmetry and between the axes of rotation of said two wheels which are mounted on each said carrier beam, steerable wheels mounted at the front of said frame forward of said cradle frame part, said steerable wheels being pivotable relative to said frame about at least one horizontal axis substantially directed parallel to the tractor's plane of symmetry, drive means connecting said front steerable wheels and the rear wheels mounted on said cradle frame part whereby such wheels are driven by said engine, and steering means for said tractor connected to said steerable wheels and only the rearmost

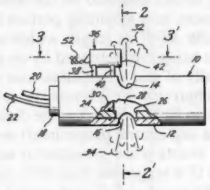
wheels of said wheels mounted on each side of said cradle frame part.

4,296,827

AIR-GUN FIRE TIME SENSOR

Ben B. Thigpen, and James A. Porter, Jr., both of Houston, Tex., assignors to Western Geophysical Company of America, Houston, Tex.

Filed Jul. 10, 1978, Ser. No. 922,952
Int. Cl.³ G01V *1/137, 1/38*
U.S. Cl. 181—107 **8 Claims**



1. A resistive sensor for determining the firing instant of an air gun that is used in seismic exploration in a body of water, the air gun including an air exhaust port for emitting a jet of compressed air, the sensor comprising:

an electrode assembly exposed to the surrounding water mounted adjacent the air exhaust port; and

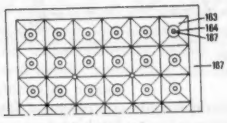
means for detecting the change in electrical resistance across said electrode assembly when said air gun is fired.

4,296,828

MOBILE DEVICE FOR GENERATING ACOUSTIC SHEAR WAVES

Pierre-Claude Layotte, Les Mathes, and Andre James, Royan, both of France, assignors to Institut Francais du Petrole, Ruell-Malmaison, France

Filed Jul. 5, 1979, Ser. No. 55,098
Claims priority, application France, Jul. 5, 1978, 78 20009
Int. Cl.³ G01V *1/047*
U.S. Cl. 181—121 **8 Claims**



1. A device for generating acoustic shear waves in the earth comprising;

a target-member having a coupling surface for coupling with the earth;

mass means for striking said target-member when coupled to the earth;

moving means operatively associated with said mass means for imparting to said mass means a velocity component parallel to said coupling surface;

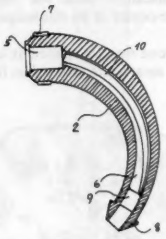
coupling means comprising a plurality of independent zones on said coupling surface for coupling with the earth; and suction means connected to said target-member for generating a suction in each zone of said plurality of independent zones for coupling said target-member with the earth at said each zone.

4,296,829

HOOK-SHAPED PART OF A BEHIND-THE-EAR HEARING AID

Jorgen R. Pedersen, Gentofte, Denmark, assignor to Danavox A/S, Copenhagen, Denmark

Filed Dec. 14, 1979, Ser. No. 103,651
Claims priority, application Denmark, Dec. 15, 1978, 5662/78
Int. Cl.³ H04R *25/02*
U.S. Cl. 181—129 **6 Claims**



1. An improved hook shaped part for a behind-the-ear hearing aid, said hook shaped part being hollow and at one end formed to be connected to an acoustic output from the upper front end of the hearing aid case and serving to transmit sound from the hearing aid in the direction of the ear, normally through a tube and an ear plug, and also serving to support the hearing aid upon the outer ear, the improvement comprising an acoustic filter arranged in the hook shaped part at the end furthest from the hearing aid and the hook shaped part having a channel of progressively increasing cross-sectional area in the direction away from the hearing aid.

4,296,830

PRODUCT PROVIDED WITH SOUND DAMPING ELEMENT

Bror L. E. Rossander; Lennart C. Ermebrant, both of Fagersta, and Martin Lesser, Lulea, all of Sweden, assignors to Fagersta A.B., Fagersta, Sweden

Filed Jul. 10, 1979, Ser. No. 56,293
Claims priority, application Sweden, Jul. 12, 1978, 7807779
Int. Cl.³ F16F *15/00*
U.S. Cl. 181—208 **9 Claims**

1. In a product of metal formed with a hole or cavity, particularly a rock drill steel, and provided with at least one element of hard material for damping noise produced during use deriving from the product when it is subjected to impacts, percussions or vibrations generating in the product sound waves annoying to the human ear, the improvement comprising the

sound damping element, which is arranged within the hole in the product, is a hollow tubular member and has at least one contact surface, which contacts the wall of the hole during use, loosely arranged relative to the wall of the hole, said sound damping element being fixedly attached within said hole to said product at at least one position of the damping element other than said contact surface to prevent longitudinal displacement of said element with respect to said product, and at least along said contact surface having a small cross-sectional area in relation to the cross-section of the hole, and said contact surface being located between the nodes of the sound waves so as to create a dry friction-producing relative movement between said contact surface of the damping element and the wall of the hole.

4,296,831

ACOUSTIC LINER FOR ATTENUATING NOISE

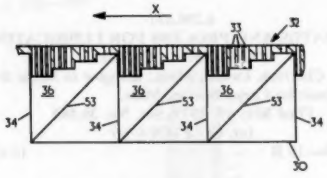
Stuart C. Bennett, Derby, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Apr. 17, 1980, Ser. No. 141,250

Claims priority, application United Kingdom, May 23, 1979, 17965/79

Int. Cl.³ E04F *17/04*

U.S. Cl. 181—224 **10 Claims**



1. An acoustic liner for attenuating noise, comprising a backing face, a perforated facing sheet and a wave guide assembly extending between the backing face and the perforated facing sheet to define a plurality of cells, the portion of the perforated facing sheet associated with each cell having a non-uniform thickness.

4,296,832

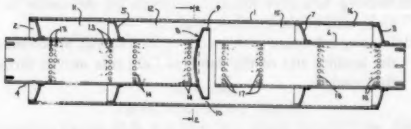
EXHAUST MUFFLER

Kenneth J. Kicinski, Stoughton, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Nov. 14, 1979, Ser. No. 94,001

Int. Cl.³ F01N *1/00*

U.S. Cl. 181—255 **7 Claims**



1. An exhaust muffler, comprising an outer casing including a body having open opposite ends and including a pair of heads to enclose the open ends of the body, an exhaust inlet tube adapted to conduct exhaust gas to the muffler and mounted within an opening in the casing, a gas outlet tube mounted within an opening in the casing, a first baffle disposed within the casing and secured across the inner end of the inlet tube, said baffle extending radially outward beyond said inlet tube, and the peripheral edge of said baffle being spaced from the inner wall of said body, a flange disposed on the outer peripheral edge of said baffle and extending longitudinally of said body to provide an annular passage between said flange and said body said baffle being free of attachment to said body, said inlet tube being spaced inwardly from said body to provide a chamber therebetween and said inlet tube having a plurality of perforations providing communication between the interior of the inlet tube and said chamber, said baffle having an imperforate central section closing off the inner end of said inlet tube, whereby the exhaust gas and the sound energy is directed outwardly through said perforations into said chamber and then passes through said annular passage for discharge through said outlet tube.

4,296,833

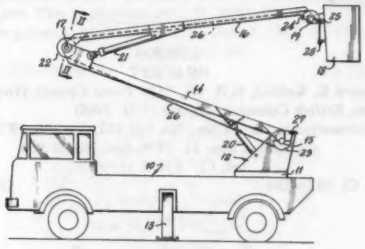
HYDRAULICALLY OPERATED ACCESS EQUIPMENT

Denis H. Ashworth, Wombourne, England, assignor to Simon Engineering Dudley Limited, Dudley, England

Filed Apr. 13, 1979, Ser. No. 30,447

Int. Cl.³ B66F *11/04*

U.S. Cl. 182—2 **11 Claims**



1. Access equipment of the kind comprising a supporting structure upon which is mounted an articulated boom assembly comprisng one or more booms, the or each boom being connected to the supporting structure or to the next adjacent boom so as to be pivotable relative thereto about a horizontal axis to enable the outermost end of the boom assembly to be raised and lowered with respect to the supporting structure, and including hydraulic actuating rams for effecting movements of the boom assembly, characterised in that a guide member is provided at each end of the or each boom, in that at least one support line, being flexible throughout at least a part of its length, is attached at one end to the supporting structure and extends to dispose its other end at the outermost end of the boom assembly, lying substantially parallel to the boom or booms, and passing around said guide members at the ends thereof and is secured at the said outermost end, in that the said support line is maintained taut along a path whose length remains constant irrespective of the configuration of the boom assembly, and in that one or more flexible control lines are arrayed parallel with said support line, from said supporting structure, around said guide members and to the outermost end of said boom assembly, whereby said one or more control lines are retained taut and in close association with said support line in all phases of articulation of said boom to thus minimize wear of said one or more control lines caused by boom movement.

4,296,834

FOLDING SAWHORSE

Walter Kroger, P.O. Box 331, Custer, S. Dak. 57730

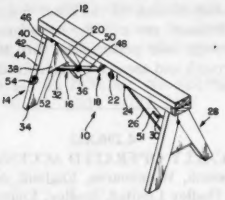
Filed Jun. 1, 1979, Ser. No. 44,454

Int. Cl.³ F16M *11/00*

U.S. Cl. 182—155 **14 Claims**

1. In a folding sawhorse having a top, two sets of folding leg pairs, and a pair of braces of resilient material each associated with one of said sets of leg pairs, each of said braces pivotally mounted at one end on one of said associated leg pairs so as to extend between said associated leg pair and said top in the sawhorse set set up position, and brace locking means on said

top engagable with the other end of each of said braces to retain said brace in a state of compression between said associated leg pair and said top with said sawhorse in a set up position, and interlock latching means for each of said braces,



which interlock means extends rigidly between a brace and either a leg pair of said sawhorse top maintaining said brace in said state of compression to provide a highly stable folding sawhorse.

4,296,835

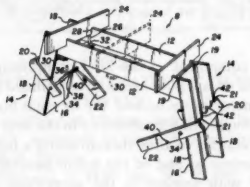
BRACKET

Leonard E. Koffski, R.R. #4, 7534 Trans Canada Hwy., Duncan, British Columbia, Canada (V9L 3W8)

Continuation-in-part of Ser. No. 916,143, Jun. 16, 1978. This application Jun. 21, 1979, Ser. No. 50,558

Int. Cl.³ F16M *11/00*

U.S. Cl. 182—184 **12 Claims**



1. A bracket for carrying a plank by means of support legs, which have a predetermined rectangular cross sectional configuration, comprising:

(a) a cross piece of predetermined length for carrying a plank;

(b) respective open faced channel members connected at each end of said cross piece and extending downwardly and outwardly therefrom, the open faces of said channel members opening in opposite directions and in the direction of the length of said cross piece, said channel members having a pair of internally rounded corners and an internal cross sectional widthwise dimension slightly larger than the widthwise dimension of said support legs such that said support legs engage with said channel members by respective contact of two corners of said support legs with the pair rounded corners of said channel members when said support legs are inserted in said channel members; and

(c) a bracket sleeve pivotally connected to each of the channel members for receiving and retaining support legs in a stationary position relative to said channel members.

4,296,836

SKY SEAT SAFETY DESCENT APPARATUS

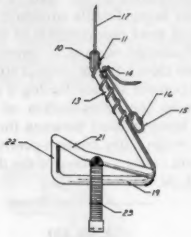
Thomas F. Cooper, Lisco, Garden County, Nebr. 69148

Filed Mar. 20, 1978, Ser. No. 888,573

Int. Cl.³ A62B *1/00*

U.S. Cl. 182—193 **2 Claims**

1. A descent apparatus comprising of a seat frame with an attached center post for retension and descending of a support rope, whereas the said support rope is placed through a confining means at the top of said center post wrapped several times around said center post placed through a lower confining



means at the lower portion of said center post and fastened to a tie-off hook attached to said center post directly below top said confining means.

4,296,837

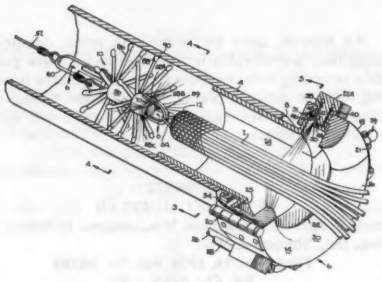
APPARATUS AND PROCESS FOR LUBRICATING ELECTRICAL CABLE

Webster T. Charlton, Lowell, Mass., assignor to Stone & Webster Engineering Corp., Boston, Mass.

Filed May 15, 1979, Ser. No. 39,484

Int. Cl.³ F16N *9/00*

U.S. Cl. 184—15 R **13 Claims**



10. A process for lubricating cable being pulled through a conduit comprising the steps of:

delivering lubricant through a nozzle to the cable at the entry end of the conduit; and

delivering lubricant to the walls of the conduit in advance of the leading end of the cable as the cable moves through the conduit.

4,296,838

AUTOMOTIVE OIL SYSTEM

Merrill L. Cohen, 222 Summer St., Worcester, Mass. 01608

Filed Jul. 27, 1979, Ser. No. 61,507

Int. Cl.³ B65D *85/00*; **F16N** *31/00*

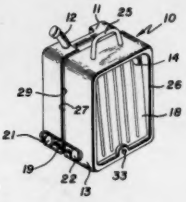
U.S. Cl. 184—106 **7 Claims**

1. Automotive oil system, comprising:

(a) a new oil container having a pouring spout,

(b) a container for used oil having an admission opening,

(c) first means holding the two containers together before use, and



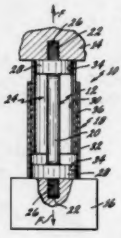
(d) second means holding the containers together after use, including a closure for the admission opening in the container for used oil.

4,296,839

STRUCTURALLY DAMPED BOLT

Robert C. Peller, and Jack E. Dyer, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Sep. 26, 1979, Ser. No. 79,237
Int. Cl.³ F16F 7/08
U.S. Cl. 188—378 **1 Claim**



1. A structurally damped device for attenuating the vibrations between two structural members and having means for connecting said device to said structural members comprising:

means defining a first primary load path designed to take the basic load between said structural elements; and

means defining a second structural load path in parallel with said primary load path;

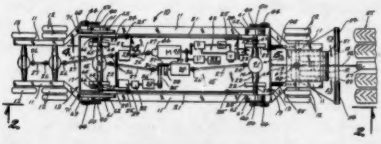
said means for defining a primary load path is a spring comprising a bolt having end bosses integral therewith and wherein said means for defining a secondary load path comprises sleeves of material one attached to each of the end bosses and placed in overlapping relationship with viscoelastic damping material located between the sleeves and loaded in shear.

4,296,840

TRACTOR PULL SLED

Richard J. Payne, R.R. #1, Box 293, Grand Island, Nebr. 68801

Filed Oct. 11, 1979, Ser. No. 83,748
Int. Cl.³ B62B 17/08
U.S. Cl. 188—8 **18 Claims**



1. A tractor pull sled comprising:

a frame having a forward end and a rearward end;

a plurality of ground engaging wheels attached to and supporting said forward end and said rearward end;

a pan movably mounted on said frame; said pan being movable between a first position wherein the weight of said pan is supported by said frame, and a second lowered position wherein said pan engages the ground and the weight of said pan is unsupported by said frame; and

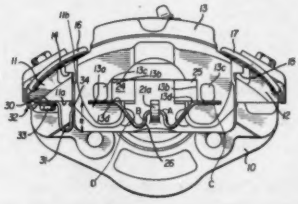
means for moving said pan between said first position and said second position at a rate which is a function of the distance of forward travel of said sled.

4,296,841

ANTIRATTLE SPRING FOR A DISC BRAKE OF VEHICLES

Fumio Fujimori; Masatada Yokoi; Masakazu Ishikawa; Hiroshi Uemura, and Akira Shirai, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 868,214, Jan. 9, 1978, Pat. No. 4,214,649. This application Jan. 31, 1980, Ser. No. 117,358
Claims priority, application Japan, Jan. 8, 1977, 52-1095
Int. Cl.³ F16D 65/04
U.S. Cl. 188—73.38 **5 Claims**



1. A disc brake having a rotor including a pair of opposed friction faces, comprising:

a fixed torque taking member;

a pair of frictional elements, respectively disposed adjacent the opposite friction faces of the rotor;

a caliper straddling a part of said rotor together with said friction elements and free to slide on said torque taking member in the direction of the axis of rotation of the rotor;

hydraulic fluid acting means incorporated into said caliper and adapted to respectively urge said friction elements to the opposite friction faces of said rotor;

a pair of radially extending portions projecting from said caliper which includes internal faces and connecting with one of said friction elements;

a resilient member comprising a middle portion, a pair of radially extending portions extending radially inwardly from opposite ends of said middle portion, opposite end portions spaced radially outwardly from said middle portion and intermediate portions interconnecting said opposite end portions with said pair of radially extending portions, respectively, said resilient member being sustained at said middle portion thereof by said one of said friction elements and resiliently abuts said radially extending portions of said caliper at said opposite end portions thereof to thereby normally urge said one of said friction elements toward abutment against said internal faces of said radially extending portions of said caliper, wherein said radially extending portions of said caliper, respectively, include a pair of axially extending projections for restraining said opposite end portions of said resilient member from upward free movement and wherein said one of said friction elements includes a projection formed at a middle part thereof and having a receiving portion formed therein such that said resilient member is force fitted in said receiving portion;

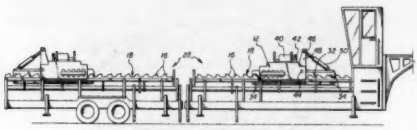
said resilient member comprising a single wire;
a pair of notches formed in said radially extending portions of said caliper;
a pair of circumferentially spaced projections on said one of said pair of friction elements respectively slidably fitted in said pair of notches; and
said resilient member being bent at both ends of said middle portion to form said pair of radially extending portions which abut said one of said friction elements; said intermediate portions, said pair of radially extending portions and said pair of axially extending projections of said caliper restraining said opposite end portions from radial free movement while radially urging said one of said friction elements against said pair of notches at said pair of projections.

4,296,842

PAWL AND RATCHET MECHANISM

Larry G. Keast, Houston, Tex., and Herbert D. Horton, Mayhill, N. Mex., assignors to World Wide Oil Tools, Inc., Houston, Tex.

Filed Oct. 9, 1979, Ser. No. 83,162
Int. Cl.[3] F16D *63/00*
U.S. Cl. 188—61 **12 Claims**



1. A pawl and ratchet mechanism comprising:
a housing having portions defining a plurality of apertures, each aperture of said plurality of apertures disposed within said housing at a fixed distance from each of the other apertures in said plurality of apertures;
a toothed track associated with said housing, said teeth of said track having spaces therebetween; and
a pawl element disposed within and movable within each of said plurality of apertures within said housing, said pawl elements being movable into and out of the spaces between the teeth of said toothed track and wherein at least one of said plurality of said pawl elements is movable into at least one of the spaces between the teeth of said toothed track irrespective of the location of said housing with respect to said toothed track when said housing engages said toothed track.

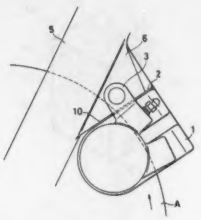
4,296,843

DISC BRAKE FOR TWO-WHEELED VEHICLE

Yukinori Nishiyama, and Hideji Ichikawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 18, 1980, Ser. No. 113,422
Claims priority, application Japan, Jan. 19, 1979, 54-7036[U]
Int. Cl.[3] F16D *55/224*
U.S. Cl. 188—73.43 **2 Claims**

1. A floating type disc brake for a two-wheeled vehicle comprising: two pad assemblies, a caliper including a caliper cylinder and a caliper arm, one of said pad assemblies being operatively coupled to said caliper cylinder and the other of said pad assemblies being supported by said caliper arm, a pin for securing said caliper to a stationary member of a fork member of said vehicle, said pin being disposed in a through-hole in said stationary member, recesses being provided in one of said stationary member and said pin within said through-hole, elastic members disposed in said recesses to at least partially fill a portion of a gap between said stationary member and said pin wherein upon application of a sufficiently high force said pin is brought into operative abutment with said stationary member so as to stop compression of said elastic members, and a collar member positioned around said pin, said



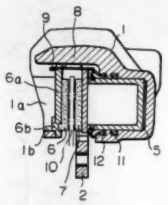
recesses in which said elastic members are disposed being provided in an outer wall of said collar.

4,296,844

FLOATING CALIPER TYPE DISC BRAKE

Koichi Tamura, Tokyo, and Tetsuo Haraikawa, Funabashi, both of Japan, assignors to Tokico Ltd., Japan

Filed Sep. 11, 1979, Ser. No. 74,807
Claims priority, application Japan, Sep. 20, 1978, 53-129172
Int. Cl.[3] F16D *65/04*
U.S. Cl. 188—73.38 **5 Claims**



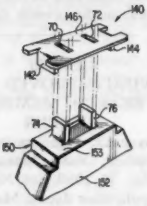
1. A floating caliper disc brake which comprises:
a. a rotatable disc to be braked,
b. a stationary member adapted to be secured to a non-rotatable structure carrying said disc,
c. a caliper slidably mounted on said stationary member through a resilient member and said caliper having a bridge portion which bridges said disc in the direction of the rotational axis of said disc and a pawl portion which is substantially normal to said rotational axis.
d. a brake actuating means providing within said caliper,
e. first and second friction pads, respectively having first and second backing plates, said pads positioned on opposite sides of said disc,
said first friction pad being adjacent to said stationary member and said second friction pad being adjacent to said pawl portion,
said second backing plate having a projection on the back portion thereof,
f. a stationary guide member attached to said stationary member and said second backing plate being suspended from said guide member and slidably guided thereon in the direction of the rotational axis of said disc,
g. a pad spring provided beneath said bridge portion, said spring imparting a biasing force on said second backing plate in the radially inward direction with respect to the circumference of said disc and a reaction force on said bridge portion,
h. a retaining member formed in said pawl portion of said caliper and being engaged by and retaining said projection, thereby countering the reaction force of said pad spring on said bridge portion.

4,296,845

ANCHOR PLATE FOR A DRUM BRAKE ASSEMBLY

James K. Roberts, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sep. 10, 1979, Ser. No. 73,754
Int. Cl.[3] F16D *51/00*
U.S. Cl. 188—341 4 Claims



1. In a drum brake assembly having a backing plate and a pair of brake shoes arranged in end-to-end relationship on said backing plate, each brake shoe comprising an arcuate rim and a substantially planar web extending transversely from said rim, the improvement comprising said backing plate having an embossed knob adjacent one end of the shoes and defining a pair of knob faces extending into the plane defined by the planar webs;

an anchor plate being force-fit into overlying engagement with said knob, said anchor plate having a substantially rectangular plate with three tabs located along two opposite edges of the plate, the central tab of said three tabs extending substantially perpendicular to said plate and defining a load bearing tab, the two tabs adjacent said central tab lying coplanar with said plate and overlying said planar webs to retain said webs in engagement with said load bearing tab; and

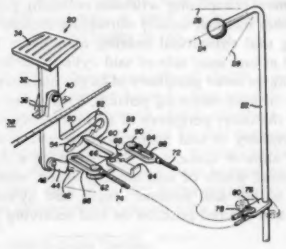
retaining means for securing said anchor plate to said knob.

4,296,846

BRAKE RELEASE MECHANISM

Samuel L. Benson, Clinton Vermillion, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 19, 1980, Ser. No. 122,545
Int. Cl.[3] B60K *41/26*
U.S. Cl. 192—4 A 6 Claims



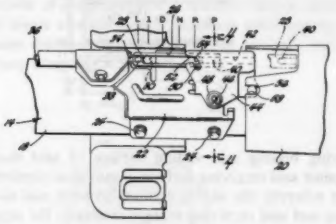
1. A brake release mechanism for a machine having a brake and a hydrostatic transmission, a transmission control means rotatable about one axis to control the input to said hydrostatic transmission, a brake control means including a brake control arm rotatable about a pivot axis and a brake cable connected to said control arm spaced from said pivot axis, the rotation of said brake control arm tensioning said brake cable to actuate said brake, and a latch means adapted to releasably retain said control arm rotational position with said brake cable tensioned to lock said brake, the improved brake release mechanism, comprising a lever connected to said transmission control means and rotatable therewith, said latch means having a rotatable latching element, said latching element rotatable into and out of latching engagement with said brake control arm, and a cable connector means interconnecting said lever and said latch means, said cable means adapted to rotate said latching element out of latching engagement with said brake control arm upon rotation of said transmission control means in either direction from a neutral position.

4,296,847

TRANSMISSION SHIFT LEVER BACKDRIVE AND COLUMN LOCKING MECHANISM

Frederick P. Arndt, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 25, 1980, Ser. No. 133,890
Int. Cl.[3] B60K *41/26*
U.S. Cl. 192—4 A 2 Claims



1. A transmission shift lever backdrive and column locking mechanism for use in a motor vehicle having a floor-mounted transmission shift lever movable in a plurality of operating conditions including "Park" and "Reverse", and a lockable steering column shift bowl operable to be positioned for locking only when the transmission is in the "Park" operating condition, said mechanism comprising; a support bracket mounted on the steering column and having integrally formed guide means; coupling means slidably disposed in said guide means and including cam means and linear guide means; flexible force and motion transmitting means connected between said coupling means and the transmission shift lever for transmitting the selected operative condition from the transmission shift lever to the coupling means; and actuator means pivotally mounted on said steering column and operatively connected with the shift bowl, said actuator means including cam slot means selectively engageable by said cam means for enforcing pivoting of the actuator means when the shift lever is moved from the "Reverse" operating condition to the "Park" operating condition for positioning the shift bowl to permit locking of the steering column, and linear guide slot means for selectively engaging said linear guide means when the transmission shift lever is moved from the "Reverse" operating condition to the other operating conditions for preventing pivoting of the actuator means and thereby preventing positioning of the shift bowl to prevent locking of the steering column.

4,296,848

FREE WHEEL HUB MECHANISM

Tooru Kagata, Toyota, and Hiromi Goto, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 26, 1978, Ser. No. 928,263
Claims priority, application Japan, Jul. 27, 1977, 52-100981[U]
Int. Cl.[3] F16D *13/04*
U.S. Cl. 192—35 4 Claims

1. A free wheel hub mechanism comprising:

a body secured to a wheel;

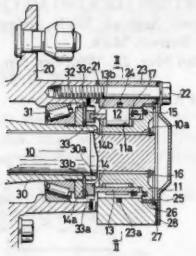
an inner race secured to an axle shaft and rotatable therewith;

means for engaging said inner race with said body only upon

rotation of said shaft and for permitting the free rotation of said body upon non-rotation of said shaft;

a shoe receiving member secured to a spindle sleeve of said axle shaft and having a receiving surface located entirely in a plane which crosses said axle shaft at a substantially right angle;

a shoe means for maintaining said engaging means in its engaged condition and having a sliding surface located entirely in a plane which crosses said axle shaft at a substantially right angle; and



a spring biasing said sliding surface of said shoe means against said receiving surface of said shoe receiving member whereby the sliding contact between said sliding surface and said receiving surface maintains the engagement of said engaging means,

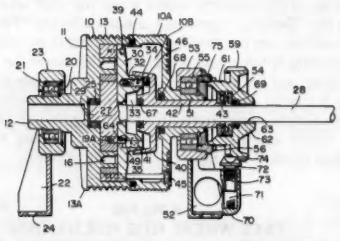
wherein said engaging means comprises a cage arranged between said inner race and said body, and rollers positioned within said cage, said rollers being urged outwardly by a cam surface provided on said inner race upon rotation of said shaft and being thus squeezed against said body.

4,296,849

AUTOMATIC TORQUE REGULATOR

Luigi Pellegrino, Conicit Apdo. 70,617 Los Ruices, Carcas, Venezuela (107)

Filed Jul. 9, 1979, Ser. No. 55,604
Claims priority, application Venezuela, Jan. 12, 1979, 44/68
Int. Cl.³ F16D *31/04*
U.S. Cl. 192—61 **15 Claims**



1. An automatic torque regulator comprising:

a chassis defining a cavity;

a central gear positioned in said cavity;

axis means for rotatably mounting said chassis and said central gear so that said central gear can be rotated independently from said chassis;

a satellite gear positioned in said cavity in engagement with said central gear;

means for rotatably mounting said satellite gear to said chassis;

means for defining first and second pressure chambers near the initial and final areas of contact between said central gear and said satellite gear;

means for providing fluid communication between said pressure chamber means and said cavity; and,

means for regulating the flow of fluid in said communication means; and

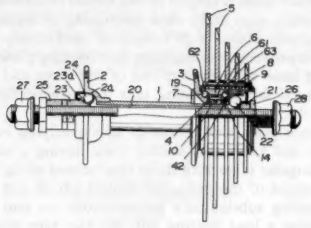
wherein said regulating means includes passages means for providing greater resistance to fluid flow therethrough in one direction than in the reverse direction.

4,296,850

REAR HUB HAVING IMPROVED MOUNTING OF A CYLINDRICAL BEARING MEMBER TO AN INNER MEMBER

Mitsuhide Isobe, Toyonaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 10, 1980, Ser. No. 128,832
Claims priority, application Japan, Mar. 19, 1979, 54-36082
Int. Cl.³ F16D *41/18;* **F16C** *35/07;* **F16H** *55/30*
U.S. Cl. 192—64 **9 Claims**



1. In a rear hub for a bicycle, which is provided with a tubular hub shell having first and second hub flanges, an inner member fixed to said hub shell and having a ball race formed axially inwardly of the inner member, an outer member supported rotatably with respect to said inner member and having at least one sprocket at the outer periphery of the outer member, first and second bearings carrying said outer member rotatably with respect to said inner member, a unidirectional rotary transmission interposed between the outer periphery of said inner member and the inner periphery of said outer member, and a cylindrical bearing member mounted on said inner member axially outwardly thereof and having ball races, the improvement comprising: a tubular receiving portion provided at said inner member axially outwardly thereof for insertably receiving said cylindrical bearing member; a fitting portion provided at one axial side of said cylindrical bearing member and having an inner periphery of larger diameter than an outer diameter of said receiving portion, to form an annular space between the outer periphery of said receiving portion and the inner periphery of said fitting portion; and, a sleeve press-fit into said annular space, said sleeve having a thickness larger than a radial width of said annular space, said sleeve, when inserted within said annular space, said cylindrical bearing member at a desired position on said receiving portion.

4,296,851

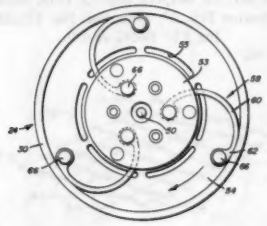
DRIVE HUB WITH CURVED SPRINGS AND DRIVE KEYS FOR ELECTRO-MAGNETIC CLUTCH

William C. Pierce, Dallas, Tex., assignor to Pitts Industries, Inc., Dallas, Tex.

Filed Jun. 1, 1979, Ser. No. 44,775
Int. Cl.³ F16D *3/00, 27/10*
U.S. Cl. 192—84 C **3 Claims**

1. In a magnetic clutch for driving a shaft including a rotatable element having a friction face positioned around and independent of the shaft, an armature disk positioned around the shaft and including a friction face in opposed relation to the

friction face on the rotatable element, an electromagnet for selectively moving the friction faces into driving engagement, that improvement comprising a flexible drive coupling between the armature disk and drive shaft, said coupling comprising a plurality of arcuately curved leaf springs, each spring having one end connected with the armature disk, means drivingly connecting the other end of each spring with the shaft to enable flexibly resilient axial, radial and circumferential relative movement between the armature disk and drive shaft, said means drivingly connecting the springs and drive shaft comprising a hub affixed to the drive shaft and including a hub plate, the armature disk being positioned around the hub plate with the inner ends of the arcuately curved springs being connected to the hub plate, each of the springs being generally



U-shaped and including an elongated central arcuate portion and radially inwardly offset ends anchored to said hub plate and armature disk, respectively, the end of each spring attached to the armature disk lying along a radius of the hub plate and armature disk and the end of the spring attached to the hub plate being disposed adjacent to but in slightly trailing relation to the same radius when the springs are not deflected, the central portion of each spring including a concave edge opening in the direction of rotation with transmission of torque between the armature disk and hub plate being transmitted through the springs with the degree of deflective elongation of the springs being determined by the torque transmitted thereby causing the central portions of the springs to straighten to increase the distance between the ends.

4,296,852

AUTOMATIC TWO-WAY CENTRIFUGAL CLUTCH FOR MOTOR DRIVEN APPARATUS

Adolf Luerken, Palos Verdes, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Continuation of Ser. No. 850,136, Nov. 10, 1977, abandoned.
This application Mar. 6, 1978, Ser. No. 883,655
Int. Cl.³ F16D *23/10, 43/24*
U.S. Cl. 192—104 B **6 Claims**

5. An automatically acting centrifugal clutch comprising

a rotating support member having a first rotation axis,

first and second single element clutch members, each said clutch member being supported by said support member along a respective pivot axis for pivotal rotation movement about said pivot axis in a plane normal to said rotation axis, and each pivot axis being parallel to, separated from, and symmetrically placed with respect to said rotation axis,

a rotatable clutch drum having

an axis of rotation concentric with said first rotation axis, and

a circular, inwardly facing, frictional drive surface radially spaced from and parallel to said rotation axis,

said clutch members each further having a center of gravity

a driving surface and a driven surface, said surfaces having a radius of curvature substantially equal to the radius of curvature of said frictional drive surface, and

said clutch members being pivotably supported so that said driven surfaces each engage said friction drive surface in a first pivotal position of each clutch member, and said driving clutch surfaces each engage said frictional drive surface in a second pivotal position of said clutch members,

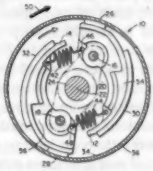
first and second spring members, each connected in a fixed positional relationship relative to said driven and driving surfaces, and between the first and second clutch members,

said first and second springs each having a first end connected to the first and second clutch members respectively substantially at the respective pivot axis of the clutch member whereby said first ends maintain a substantially fixed position as the respective clutch member pivots about the respective pivot axis,

each of said springs being under tension, and

each spring, at a respective second end, being connected to a respective clutch member for urging said corresponding driving surface against said frictional drive surface in a start-up state, and connected at a position spaced further from said clutch pivot point than the center of gravity of said respective clutch member and

said single element clutch members each having a fixed mass distribution and said springs having a spring constant whereby



whenever the rate of rotation of said support member is below a first rotational speed, said driven surface engages and is in contact with said frictional drive surface,

upon rotation of said support member beyond said first rotation speed and less than a second rotation speed greater than the first rotation speed, said driven clutch surface pivots out of engagement with the frictional drive surface, and

upon rotation of said support member beyond said second rotation speed, said driving clutch surface is urged against and engages said friction drive surface with a force which is a monotonically increasing function of the rotation speed, and

whereby, when said clutch members pivot from said first position wherein said driven clutch surfaces engage said frictional drive surface to said second position wherein said driving clutch surfaces engage said frictional drive surface, said spring members extend at a rate greater than the radial rate of travel of each clutch member center of gravity thereby defining a range of rotational speed in which the clutch surfaces do not engage the frictional drive surface.

4,296,853

ROTATION-ELASTIC, SHOCK AND VIBRATION DAMPING CLUTCH

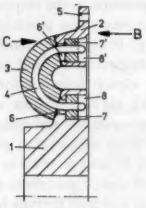
Curt Krönert, Mülheim, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Oct. 16, 1979, Ser. No. 85,220

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1979, 2844849

Int. Cl.³ F16D *3/68*

U.S. Cl. 192—106.1 **7 Claims**



1. A rotation-elastic, shock and vibration damping clutch, comprising, an outer ring part, an inner ring part arranged within said outer ring part, each of said outer and inner ring parts having a plurality of generally axially extending apertures therethrough which are arranged in circumferentially spaced locations, an elastic pressure pad of arc-shaped cross-section extending between said inner and outer ring portions and having respective ends abutting against respective sides of said inner and outer ring portions around each of the respective apertures, at least one non-elastic rope having a diameter substantially smaller than that of said apertures extending through said elastic pressure pad and being connected thereto and also extending through each of the respective apertures and being evenly distributed around the circumference of said rings, and spring means resiliently supporting said rope adjacent each of said apertures so that said rope does not touch said ring parts in any areas bounding the apertures.

4,296,854

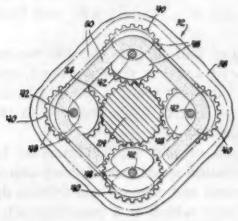
FLEXIBLE CLUTCH WITH AN ELASTOMERIC VIBRATION DAMPER

Vincent M. Staub, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1980, Ser. No. 131,923

Int. Cl.³ F16D *3/14*

U.S. Cl. 192—106.1 **1 Claim**



1. An elastomeric drive mechanism disposed in series with a friction drive mechanism, comprising: an input pressure plate member; an output shaft having a splined exterior; a plurality of gear members rotatably mounted on said pressure plate and meshing with said splined portion of said output shaft, a cam member secured to each of said gear members for unitary rotary movement therewith; and an elastomeric band means operatively connected with and circumscribing the outer portion of said cam members, said gear members providing a drive connection between said pressure plate and said output shaft and said elastomeric band means permitting relative angular excursion between said pressure plate and said output shaft, and said cam members generating increased tension forces within said band means upon increased angular excursion between said pressure plate and said output shaft to provide increased torque capacity in said elastomeric drive mechanism while limiting the transmission of torsional vibrations.

4,296,855

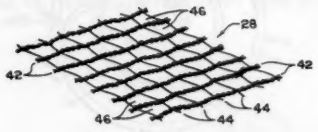
ELECTRICALLY CONDUCTIVE FABRIC

Gary L. Blalock, Canal Fulton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 941,871, Sep. 13, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,291

Int. Cl.³ B65G *43/00*

U.S. Cl. 198—502 **5 Claims**



3. For use as a controlling antenna to detect rips in a flexible conveyor belt in which it is located,

a flexible fabric constructed of first yarns extending in a first direction and second yarns extending in a second direction transverse to said first direction,

the yarns in at least one of said directions extending from end to end of the fabric and being formed of a plurality of strands previously and continuously provided along their entire lengths with electrically conductive particles to form a continuous electrically conductive path across the fabric and substantially from edge to edge of the conveyor belt in which it is located,

said first and second yarns being joined together in an open mesh configuration with interstices therebetween, and

elastomeric material of the conveyor belt in which the fabric is located being on both sides of said yarns and in contact therewith and extending through the interstices of said fabric to hold said fabric in its open mesh configuration and fixedly positioned within the conveyor belt in which it is located.

4,296,856

MATERIAL GATHERING DEVICE FOR A MINING MACHINE

Donald L. Freed, Jr., Belleville, Ill., assignor to National Mine Service Company, Pittsburgh, Pa.

Filed Jan. 3, 1980, Ser. No. 109,333

Int. Cl.³ B65G *65/02*

U.S. Cl. 198—514 **9 Claims**

1. A material gathering device for a mining machine comprising,

a gathering platform extending forwardly from said mining machine for slidable engagement with the mine floor,

said gathering platform having a forward edge portion and opposite side portions extending rearwardly from said forward edge portion,

deflector means for deflecting loose material deposited on the mine floor adjacent said forward edge portion and said opposite side portions onto said gathering platform,

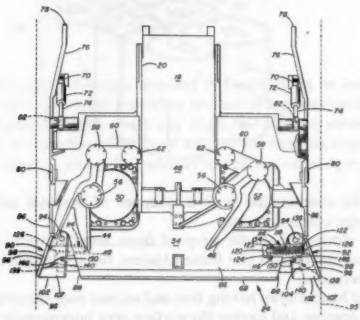
means for pivotally mounting said deflector means on said gathering platform adjacent said opposite side portions,

said deflector means having an upstanding wall portion adapted to be positioned closely adjacent the mine wall and a material receiving surface extending from said up-

standing wall portion toward said respective opposite side portion of said gathering platform,

resilient means extending between said gathering platform and said deflector means for urging said delector means upstanding wall portion to a position to deflect the loose material located on the mine floor at the mine wall onto said material receiving surface for movement therefrom onto said gathering platform,

said resilient means being freely movable between a compressed length and an uncompressed, free length to permit pivotal movement of said deflector means between a retracted position and an extended position relative to said gathering platform side portions,



a stop plate secured to each of said gathering platform side portions,

said deflector means including a portion overlying and movable relative to said gathering platform,

said deflector means portion having an abutment surface positioned oppositely of said respective stop plate so that upon pivotal movement of said deflector means said abutment surface is movable into and out of abutting contact with said stop plate, and

said deflector means being restrained from outward pivotal movement when said resilient means extends to said uncompressed, free length by abutting contact of said abutment surface with said stop plate.

4,296,857

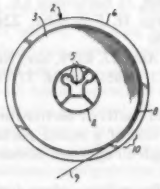
PROTECTIVE BAN[illegible] FOR PHOTOSENSITIVE FILM ON SPOOLS

William V. Huck, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 16, 1980, Ser. No. 112,159

Int. Cl.[3] B65D *85/67, 85/671*

U.S. Cl. 206—53 **10 Claims**



1. A spool and photosensitive film comprising a core and flanges extending from the core and having photosensitive film wrapped in a spiral about the core and between the flanges having as an improvement thereon an opaque band having a width nearly equal to or greater than the width between the flanges, a length in excess of the circumference of the outermost layer of film on the spool, so that the band overlaps itself, and a pitch in its relaxed state of from one eighth to eight times the width of the band, and a portion of the film extending out from the area where the band overlaps itself.

4,296,858

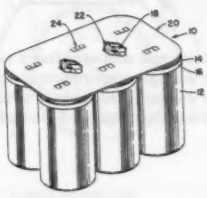
TWO-WAY CONTAINER PACKAGE

John R. Platt, Wheaton, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 40,620, May 21, 1979, abandoned. This application Dec. 14, 1979, Ser. No. 103,772

Int. Cl.[3] B65D *75/00*

U.S. Cl. 206—150 **3 Claims**



1. In a two-way package for can-type containers which have lids configured to include retained tear tab opening devices, the package including a predetermined plurality of such containers secured in an array by a thermoplastic strip device having a plurality of container carrying bands, each band surrounding, resiliently engaging and retaining a predetermined circumferential region of side wall of an associated container, said strip further including finger hole means of predetermined dimension and located within the outer perimeter of the package thus formed, a flat sheet-like member overlying the lids of the packaged array of containers, means for securing the sheet-like member to the package, a plurality of elongated slot means formed in the sheet-like member, the major dimension of said slot means being not less than the width of the retained pull-tab so that the tab may be inserted therethrough, the slot means further including means to lockingly retain the tabs to the sheet member after the tabs are inserted therethrough, the slot means being equal in number to the containers included in the array with each slot means spaced inwardly from the outer perimetrical margin of the sheet member and located so as to generally overlie the center of the lids of the associated containers when retained by the thermoplastic device, the retained tear tabs include an aperture formed therein, the means for lockingly retaining the tabs to the sheet member including a flap extending across the minor dimension of each slot means, the flaps having a width less than the major dimension of the slot means and not greater than the transverse dimension of the aperture in the retained tab, the length of the flap being substantially equal to the minor dimension of the slot means so the flap may snap into and through the aperture in the tab when the tab is inserted through the slot means, wherein the sheet member may be utilized to repackage the empty containers.

4,296,859

PIGMENT PACKAGE

John L. McClinton, Hanover, Md., assignor to The Burns and Russell Company, Baltimore, Md.

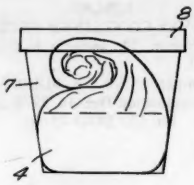
Filed Aug. 22, 1979, Ser. No. 68,599

Int. Cl.[3] B65D *81/32;* **B32B** *7/02;* **C08L** *51/00*

U.S. Cl. 206—219 **12 Claims**

1. A package comprising an external rigid container, a removable lid for said rigid container, an internal container suitable to be filled into and removed from the rigid container as an assembly, said internal container including an oriental polystyrene film having a pigmented 100% liquid unsaturated reactive polyester resin therein in the form of a viscous substantially non-flowing paste, the film of said internal container being in at least partially krinkled condition within said rigid

container, the volume of said paste being sufficiently less than the volume of said external rigid container with said lid thereon that the remaining volume when filled with said krin-



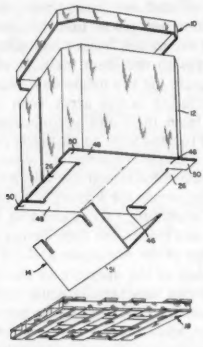
kled film of the internal container that it acts as a cushion and shock absorber during transportation and prevent the internal container from moving unnecessarily while permitting ready removal of said internal container from said external container.

4,296,860

BULK MATERIAL BOX

Fu-Tong Hsu, Bridgewater, and John F. Kantz, Oxford, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,066
Int. Cl.[3] B65D *19/06*
U.S. Cl. 206—386 **13 Claims**



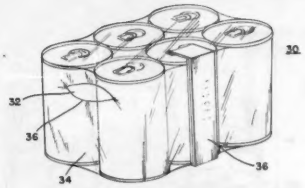
6. A unitary storing and shipping container assembly for bulk solid material comprising: a box having a removable top, a body member, and a base member, and a rigid pallet secured to and supporting said box at its base; said box formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending integral flaps inwardly folded within said outer periphery to form a portion of the base of said box and providing, when infolded, two opposing pairs of infolded flaps, the first of said opposed pairs having panels defining a rectangular configuration and the second of said opposed pairs having panels defining a trapezoidal configuration, said base member having opposite ends which interlock with each of the panels of said first opposed pair; said infolded flaps and base member providing the base and alignment of said box to said supporting pallet and the resultant unitary container assembly.

4,296,861

ELASTIC BAND AND HANDLE STRUCTURE FOR FORMING PACKAGES OF GROUPS OF CONTAINERS

Marshall J. Barrash, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 65,421, Aug. 10, 1979. This application Jun. 20, 1980, Ser. No. 161,493
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.[3] B65D *75/56, 85/62*
U.S. Cl. 206—428 **7 Claims**



1. In combination with a wrapper of material defining a package configuration:

an elongated handle strap of finite length extending over substantially a like finite adjacent surface length of a said wrapper;

said handle strap having first and second ends secured to said wrapper and having the surface area intermediate its ends substantially juxtaposed with the adjacent said surface of said wrapper;

said wrapper comprising an endless band of elastic material for surrounding a said package configuration in a stretched and tensioned condition;

said handle strap being in substantially unstretched condition when said endless band is in said stretched and tensioned condition;

said handle strap being in a relatively loose and nonjuxtaposed condition with respect to said adjacent surface of said endless band when the latter is in an unstretched condition; and

said handle strap comprising:

an elongated strip of material having a coextensive layer of adhesive thereon;

a central gripping portion defined by a centrally disposed laminate adhered to said adhesive layer while leaving an exposed area of said layer of adhesive at each end thereof;

said exposed areas of said layer of adhesive providing securing means for holding said handle strap on said wrapper.

4,296,862

DEVIOUS PATH BACTERIAL BARRIER

James L. Armentrout, 21 Barlovento Ct., Newport Beach, Calif. 92663, and George H. Schneider, 22475 Overlake Dr., El Toro, Calif. 92630

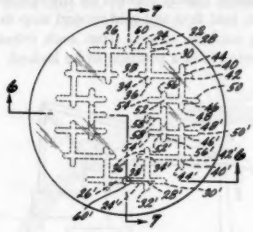
Filed Aug. 27, 1979, Ser. No. 70,134
Int. Cl.[3] B65D *81/24, 33/16, 51/16*
U.S. Cl. 206—439 **24 Claims**

1. A devious path bacterial barrier for providing an air/gas pathway into and out of a sealed package from an exterior environment through an aperture in one wall of the package, including

a flat member lying within a plane and having spaced openings extending into the flat member on opposite sides of the flat member and with one of the openings for communicating with the exterior environment and with the other of the openings for overlying the aperture in the one wall of the package,

a pathway extending between the openings of the flat member and with the pathway extending within the flat member and along the plane of the flat member for intercon-

necting the openings and providing an air/gas pathway for both directions of air/gas flow between the one opening of the flat member and the other opening, and



the pathway including a plurality of bends along its length and with each bend providing an eara to trap any bacteria introduced into the pathway from the exterior environment to the one opening and with all the bacteria trapped at a distance along the pathway before the other opening.

4,296,863

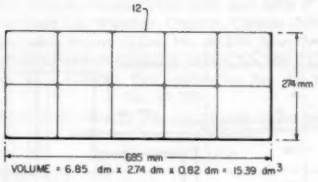
LIDDED CONTAINER STRUCTURE AND PACKAGE STRUCTURE FOR SAME

Henk Stokkers, Groenlo, Netherlands, assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 900,743, Apr. 27, 1978, Pat. No. 4,195,465. This application Dec. 18, 1979, Ser. No. 104,821

Int. Cl.³ B65D *21/02, 85/62*

U.S. Cl. 206—504 **3 Claims**



3. A package structure characterized by minimized exterior dimensions for a given number of filled, open-mouthed containers each having a circular bottom wall and an initially frusto-conical sidewall initially defining an open container mouth of circular configuration opposite said bottom wall, said package structure comprising:

a square configured lid means on each of said filled containers deformably engaging each said sidewall and covering said container mouth therein to constrain said container mouth to assume a square configuration and said sidewall to assume a transitional configuration from said circular bottom wall to said square configured lid and container mouth;

a said given number of said filled containers in juxtaposition through their respective square configured lid means to define a rectangular grouping of said given number of containers; and

a bulk package means confining said rectangular group of containers.

4,296,864

AIR CLASSIFIER

Takaaki Misaka, Koganei; Takeshi Furukawa, Kawasaki, and Eiichi Onuma, Narashinc., all of Japan, assignors to Onoda Cement Co., Ltd., Japan

Filed Jul. 9, 1980, Ser. No. 167,048

Claims priority, application Japan, Jul. 17, 1979, 54/89793; Jul. 17, 1979, 54/89794

Int. Cl.³ B04C *5/103*

U.S. Cl. 209—144 **31 Claims**

1. An air classifier which comprises:

a casing formed of a generally hollow cylindrical vertical casing body and a hopper fitted to the lower end of said casing body;

a fine product outlet duct set at the center of the upper end wall of the casing body;

an air-powder raw material inlet duct tangentially projecting outward from the casing body;

a rotary shaft concentrically extending through the casing body;

a rotary disc member concentrically fixed in the casing body and set at a boundary between the casing body and the hopper to concurrently carry out the dispersion and classification of a powdered material; and

guide vanes provided in the casing body in a state equidistantly spaced from each other in the circumferential direction of said casing body to conduct a mixture of air and a powder raw material into said casing.

4,296,865

MAGNETIC SEPARATOR HAVING TWO ROTATING MAGNETIC DRUMS OF OPPOSITE POLARITY

Heinrich Spodig, Netteberge 202, D-4714 Selm/Westf., Fed. Rep. of Germany

PCT No. PCT/DE78/00009, § 371 Date Mar. 25, 1979, § 102(e) Date Mar. 19, 1979, PCT Pub. No. WO79/00060, PCT Pub. Date Feb. 22, 1979

PCT Filed Jul. 5, 1978, Ser. No. 24,181

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1977, 2733473

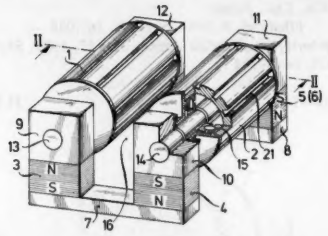
The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.³ B03C *1/02, 1/26*

U.S. Cl. 209—216 **1 Claim**

1. A magnetic separator comprising the combination of two rotatable magnetic drums of opposite polarity forming a working air-gap therebetween, each said drum including a plurality of grooves distributed in a radial direction around their peripheries and extending in an axial direction, said combination further including two directionally magnetized block magnets arranged on each side of said magnetic drums, said drums being arranged in a housing comprising a pair of slide plates positioned in the working air-gap, said plates converging at the inlet and diverging at the outlet, said block magnets being disposed in a closed magnetic circuit and being connected in pairs at the bottom part of their poles of unlike polarity by means of soft-iron parts, said block magnets having on the

upper side of their poles of unlike polarity a pair of axially spaced apart pole shoes in which soft-iron parts are disposed



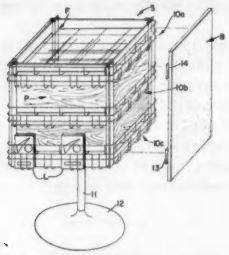
and which last mentioned soft-iron parts serve as the axles for said rotatable magnetic drums.

4,296,866

ARTICLE DISPLAY STAND

Stanley J. Learnard, 12659 Willow Spring Ct., Herndon, Va. 22070

Filed Apr. 5, 1979, Ser. No. 27,385
Int. Cl.³ A47F *5/01, 5/02*
U.S. Cl. 211—131 **12 Claims**



1. An article display stand, comprising: a frame; and a plurality of pairs of stacked wire baskets supported on the frame, with each pair including a top basket and a bottom basket, the top basket including first wires spaced apart a first distance, and the bottom basket including second wires spaced apart a second distance less than the first distance, and the wires of both baskets of each pair defining a plurality of article supporting and display pockets wherein the first wires of the top basket define side supports for the articles in the pockets and the second wires of the bottom basket define bottom supports for the articles in the pockets.

4,296,867

DEVICE FOR LOCKING SLEWING PORTION OF CARGO CRANE

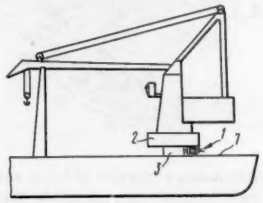
Iosif M. Berkhin, prospekt Gagarina, 17, kv. 35; Robert A. Gudze, prospekt Gagarina, 17, kv. 11; Vasily I. Kekalo, ulitsa Letchikov, 33, kv. 88, all of Sevastopol; Nikolai N. Panasenko, Volgodonsk, ulitsa Morskaya, 118, kv. 46, Rostovskaya oblast; Viktor I. Podbeltsev, ulitsa B. Morskaya, 38, kv. 4, Sevastopol; Zinaida D. Tsypina, ulitsa Volodarskogo, 5, kv. 5, Sevastopol, and Vladislav N. Mukhin, ulitsa B. Morskaya, 52/2, kv. 36, Sevastopol, all of U.S.S.R.

Filed Sep. 16, 1979, Ser. No. 75,108
Int. Cl.³ B66C *23/62*
U.S. Cl. 212—229 **7 Claims**

1. In a cargo crane having a slewing portion movable with respect to a stationary portion, a device for locking the slewing portion relative to the stationary portion comprising:

first stop means rigidly secured on the slewing portion of the crane;

second stop means rigidly secured on the stationary portion of the crane, said first and said second stop means having confronting surfaces spaced from each other when said slewing portion is in a position to be locked;



wedge means movable into a space between the confronting surfaces for frictionally engaging each of the confronting surfaces to thereby lock said first stop means relative to said second stop means; and

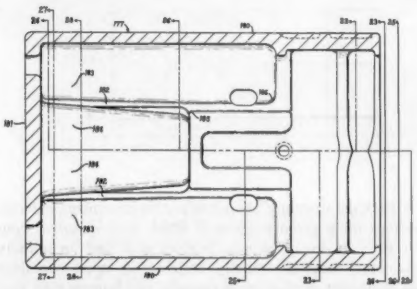
drive means for bringing said wedge means into and out of frictional engagement with said confronting surfaces.

4,296,868

HOUSING FOR DRAFT GEAR

Richard J. Housman, Dolton, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Continuation of Ser. No. 841,769, Oct. 13, 1977, abandoned.
This application Nov. 21, 1979, Ser. No. 96,342
Int. Cl.³ B61G *9/20*
U.S. Cl. 213—50 **3 Claims**



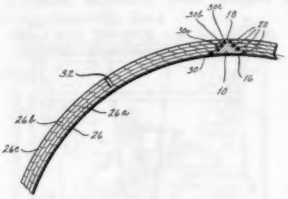
1. A draft gear housing of a generally rectangular cross section defined by a top wall, a bottom wall, a pair of opposing side walls, a rear wall and an open end opposite said rear wall; said top wall and said bottom wall having internally disposed thereon longitudinally extending strengthening ribs partially defining a main spring chamber and corner spring chambers, each of said ribs having a rear portion comprising a pair of opposing arcuate sides culminating at a peak, one of said arcuate sides of each rib partially defining one of said corner spring chambers, and the other of said arcuate sides of each rib partially defining said main spring chamber, said other of said arcuate side of each of said ribs gradually increasing in radius of curvature from said rear wall toward said open end so as to produce a decrease in both width and height of each said ribs.

4,296,869

PRESSURE VESSEL HEAD

Maan Jawad, Collinsville, Ill., assignor to Nooter Corporation, St. Louis, Mo.

Filed May 18, 1979, Ser. No. 40,597
Int. Cl.[3] E04B *1/32*
U.S. Cl. 220—3 10 Claims



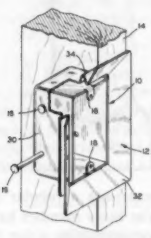
1. A head for a pressure vessel, said head comprising: a frame having stiffeners arranged to form a grid, with each stiffener having a series of alternate lands and shoulders; plates closing the openings in the grid, there being a plurality of plates in each opening of the grid with the plates of each opening becoming progressively larger in surface area through the opening, the plates in each grid opening being stacked one upon the other such that the adjacent plates of each opening are directly against each other, the plates of each grid opening further being configured and positioned such that the shoulders for the stiffeners that are along the opening face the side edges of the stacked plates and the lands of the stiffeners underlie the peripheral portions of the plates; and welds along the peripheries of the plates and adjacent surfaces of the stiffeners for attaching the plates to the stiffeners, the welds for successive plates being offset from each other by reason of the variances in the size of the plates.

4,296,870

COVERS FOR ELECTRICAL BOXES

G. Russell Balkwill, 2429 Howard Ave., Windsor, Ontario, Canada (N8X 3Y5); Jules P. Robinet, 2865 Virginia Park, Windsor, Ontario, Canada (N9E 2B8), and John F. Tamasovics, 2530 Todd La., Windsor, Ontario, Canada (N9H 1K5)

Continuation-in-part of Ser. No. 36,436, May 7, 1979, abandoned, which is a continuation of Ser. No. 908,223, May 22, 1978, Pat. No. 4,158,420. This application Jun. 12, 1979, Ser. No. 47,793
The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.
Int. Cl.[3] H02G *3/08*
U.S. Cl. 220—3.3 14 Claims



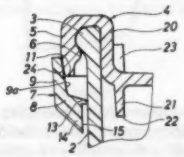
1. In combination, a metal electrical box having an open face, a cover of flexible plastic material having a receptacle extending around and enclosing the back and at least portions of the sides of said box and forming an air and vapor barrier around said box, said cover leaving the open face of said box uncovered, said cover having a slanted flange around the perimeter near the open face of said box and having a slanted front surface extending outwardly therefrom and slanting away from said cover, whereby the peripheral edge of the flange can tightly contact the back surface of a wall or the like around the open face of the box, said cover providing a barrier to prevent water from entering the outlet box through the sides and back thereof, and said cover having means by which the open face of said electrical box can extend beyond said slanted flange by varying distances.

4,296,871

RECEPTACLE WITH A COVER OF PLASTICS MATERIAL

Poul G. Andersson, Salzburg, Austria, assignor to Ring Lock Container S. A., Panama City, Panama

Filed Jul. 23, 1979, Ser. No. 59,685
Int. Cl.[3] B65D *43/10, 43/03, 17/28*
U.S. Cl. 220—306 11 Claims



1. In a receptacle of the type which has a continuous sidewall with an open top end; an external circumferential bead on said sidewall substantially at said open top end, a cover of plastic material which has a depending circumferential flange provided with an internal circumferential bead which snaps beneath the lower portion of said external bead to tightly close the cover onto the receptacle sidewall, and a downward extension of said flange below said internal bead, the improvement comprising, in combination:

an integral external locking ring surrounding said receptacle sidewall, said locking ring being effectively L-shaped in cross section with a lower ledge beneath the cover flange and an upright annular rib encircling at least a major portion of the downward extension of the cover flange,

an integral annular wall on said cover having an outwardly facing surface fitting snugly against the inner surface of the receptacle sidewall radially inwardly of said beads,

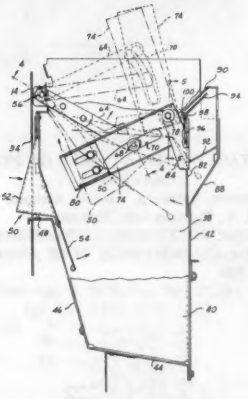
connecting means connecting the locking ring lower ledge to the receptacle sidewall, said connecting means being defined at least in part by circumferentially spaced connections creating a zone of weakening, and

reinforcing means extending downwardly from said spaced connections in close proximity to the container wall, said reinforcing means permitting rupture of said connections by a downward translational force applied to the locking ring parallel to the receptacle sidewall to give access to the lower edge of the cover flange to remove the cover from the container, while the close proximity of said reinforcing means to the container wall limits inward displacement of said reinforcing means and correspondingly limits outward displacement of said rib to a distance insufficient to give access to the lower edge of the cover flange, thereby to effectively prevent removal of said cover from the container as long as said connections remain unruptured.

4,296,872
DELIVERY BOX ASSEMBLY FOR MERCHANDISING MACHINE

Robert P. Mitchell, Pequannock, and Frank T. Scalera, Maplewood, both of N.J., assignors to Rowe International, Inc., Whippany, N.J.

Filed Sep. 21, 1979, Ser. No. 77,611
Int. Cl.³ G07F *11/00*
U.S. Cl. 221—195 **11 Claims**



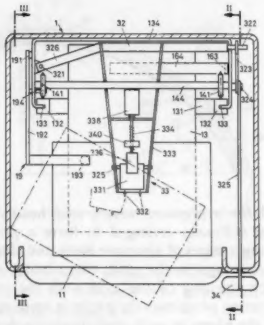
5. A delivery box assembly for receiving an article of merchandise from a dispensing unit and for holding the article at a location at which it is accessible to a customer including in combination, a box having a first opening through which said box is to receive an article from said dispensing unit and having a second opening through which said article may be removed by a customer, a door, first shaft means mounting said door adjacent to said second opening for movement between an open position and a closed position, a baffle, second shaft means mounting said baffle for movement between an inoperative position and an operative position at which it effectively blocks said first opening, respective left-hand and right-hand first cranks on said door mounting shaft means for movement therewith, respective left-hand and right-hand second cranks on said baffle shaft means for movement therewith, pins carried respectively by one of each of said first and second cranks, the other of each of said first and second cranks being formed with a slot for receiving one of said pins to provide connections between said first and second cranks, said pin and slot connections being such that said baffle moves to its operative position in response to movement of said door to its open position.

4,296,873
AUTOMATIC VENDING ARRANGEMENT

Alois Schlumpf, Zumikon, Switzerland, assignor to Tax o mex AG, Switzerland

Filed Dec. 11, 1979, Ser. No. 102,362
Claims priority, application Switzerland, Dec. 12, 1978, 12645/78
Int. Cl.³ B65H *3/22*
U.S. Cl. 221—213 **6 Claims**

1. In an automatic vending arrangement for the sale of newspapers or periodicals, a housing having a dispensing slot at the upper front side thereof; including a cash box arrangement and a dispensing arrangement, said cash box arrangement including coin testing means, coin return means and coin receiving means; and actuating means for said dispensing arrangement, said dispensing arrangement including a vertically displaceably guided support table and a lever-actuated dispenser, the improvement comprising: at least one set of pulleys for raising said support table having one end of the pulley fastened to said table and another end to said housing; spring means for pulling said pulley downwardly; sensor means having sensor arm means supported in a horizontal pivot bearing at one end thereof, including a sensor feeler directed against said support table and sensor pin means engageable in the raised position into a sprocket roll for rendering stationary said set of pulleys; a pivot lever pivotable in a horizontal plane about a vertical

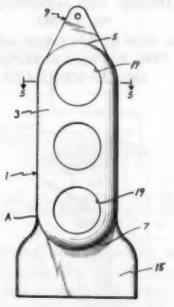


rotational axle arranged sidewise of the area of said support table; linkage means connecting the free end of said pivot lever with a handgrip for changing a direction of movement; and a gripper arm being vertically movably linked to said pivot lever and arranged at least approximate the middle axis of said support table, said gripper arm including a vertically movable gripper pawl linked thereto having gripper needles and release and latching means for said gripper latch.

4,296,874
BALL HOLDER

Roger C. Evans, 10214 Dogwood Ave., Palm Beach Gardens, Fla. 33410

Filed Dec. 1, 1976, Ser. No. 746,592
Int. Cl.³ B65D *85/58*
U.S. Cl. 221—307 **1 Claim**



1. A ball holder comprising a tubular body member for holding balls, said tubular body member having a bottom for supporting balls, said bottom having a slot therein, a flattened tubular member extending from the bottom of said tubular body member around said slot and forming the bottom end of the holder, said tubular body member having a closed top, said top having a holding means for supporting the ball holder, said bottom of said tubular body member and said flattened tubular member being formed of a resilient material so that they can be temporarily deformed to a size to permit a ball to pass therethrough, the interior of the bottom of the tubular body member

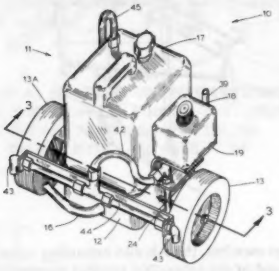
being spherically shaped for matching the contour of the balls being held to support a ball by having surface contact.

4,296,875

FOAM DISPENSING APPARATUS FOR MARKING ON A GROUND SURFACE THE WORKING PATTERN OF A SURFACE WORKING VEHICLE

Richard P. Borglum, Janesville, Iowa, assignor to Richway Industries Ltd., Janesville, Iowa

Filed Nov. 29, 1979, Ser. No. 98,500
Int. Cl.³ A01C *15/00*; B05B *7/30*
U.S. Cl. 222—617 **3 Claims**



1. A foam dispensing apparatus mountable on a ground surface working vehicle for marking on the ground surface the working pattern of the vehicle on said surface, said apparatus comprising:

(a) a storage tank on said vehicle for containing a foaming agent solution;

(b) a combination air pump and foam generating unit including a rotary driven member rotatably mounted on said vehicle;

(c) a series of circumferentially spaced roller members;

(d) means mounting said roller members on said rotatable member in a circular row about the axis of rotation of said rotary member;

(e) a flexible tube member arranged in a plane parallel to the plane of rotation of said rotary member having an inlet section, an outlet section, and an intermediate section;

(f) means mounting said tube member on the vehicle with said intermediate section trained about and in pressing engagement with certain of said rollers, said pressing engagement acting to close said tube at each of said certain rollers;

(g) means for fluid coupling said inlet section of the tube, with said tank to receive the foaming agent solution;

(h) an air inlet for supplying air to said tube inlet section;

(i) a valve unit in said fluid coupling means located between said tank and said air inlet for controlling the rate of admission of the foaming agent solution into said inlet section for mixing with the air from said air inlet, with portions of the foaming agent solution and air being mixed and successively moved through the tube by the engaged rollers for flow into the outlet section in a foam form and,

(j) a foam discharge unit connected to the outlet section for directing the foam to the ground surface adjacent one side of said vehicle.

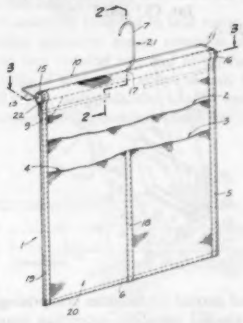
4,296,876

GARMENT CHECKING BAG

Henry R. Lefebvre, Laguna Hills, Calif., assignor to Sun Aired Bag Co., Inc., Sunland, Calif.

Filed Mar. 29, 1979, Ser. No. 25,197
Int. Cl.³ A47J *51/08, 51/14*
U.S. Cl. 223—91 **3 Claims**

1. A garment bag structure including horizontal bar means, hook means projecting upwardly from an opening in an intermediate portion of said horizontal bar means, a foraminous bag attached to and depending from said bar means, and a horizontal rod means attached to said bar means, said horizontal bar means comprising a cylindrical member having an opening in



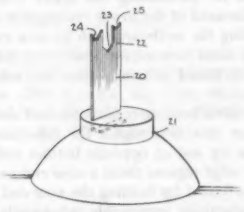
each end thereof, and said horizontal rod means having bent portions at each end thereof that rotatably engage the openings at the ends of said horizontal bar means, said horizontal rod means being rotatable to a position contiguous with said bag, whereby said structure occupies a relatively narrow space.

4,296,877

NEEDLE THREADER

Allen Lubow, 300 Clinton Ave., Brooklyn, N.Y. 11205

Filed Jan. 7, 1977, Ser. No. 757,685
Int. Cl.³ D05B *87/02*
U.S. Cl. 223—99 **6 Claims**



1. A needle threader usable by individuals who find it difficult to thread a needle in a conventional manner, said needle having an alongated eye with a predetermined length and width, said threader comprising:

A. a blade whose upper end is of uniform width and thickness and is cut to define a V-notched head, across whose trough the end of the yarn or filament to be threaded is loosely laid, said blade end having a width which is less than the length of the eye and a thickness which is less than the width of the eye which makes it possible to pass the eye of the needle to be threaded over the end of the blade to a point well below the trough to cause the end of the yarn or filament to be curved into a sizable loop whose feet are clamped to the sides of the blade by the eye of the needle, whereby when the needle is thereafter retracted from the head it carries from the loop therewith, which loop can then be grasped and pulled out to thread the needle, said head being effectively divided into at least two notched sections of different width, with troughs of different depths; and

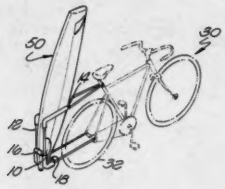
B. means to anchor the lower end of the blade.

4,296,878

SURFBOARD CARRIER

Franklin D. Ward, and Rock A. Engeman, both of 5582 Kern, Huntington Beach, Calif. 92649

Filed Jun. 8, 1979, Ser. No. 46,989
Int. Cl.³ B62J *7/00*
U.S. Cl. 224—32 A **4 Claims**



1. A surfboard carrier for bicycles comprising:

a pair of U-shaped members extending rearward of and opening toward the bicycle for being positioned on opposite sides of the rear wheel of the bicycle, each U-shaped member having an upper attachment end for being attached to an upper portion of the bicycle and a lower attachment end for being attached to a lower portion of the bycicle;

first and second cross members attached between the pair of U-shaped members at spaced locations rearward of the bicycle for defining a lower, generally rectangular, retention region;

a third cross member attached between the pair of U-shaped members at a location above the first and second cross members for defining an upper, generally U-shaped, retention region opening away from the bicycle, wherein the third cross member is forward of the first and second cross members for positioning the upper U-shaped retention region forward of the lower rectangular retention region for holding the surfboard with its nose end down and its skag end tilted forward for positioning the center of gravity of the board generally over the rear wheel of the bicycle;

first elastomeric holding means attached about the inside of the lower retention region for simultaneously pressing against a top and an opposite bottom surface region and opposite edge regions about a nose end peripheral portion of the surfboard for holding the nose end peripheral portion substantially immovable side-to-side and back-and-forth; and

second elastomeric holding means attached about the inside of the upper retention region for pressing against a top and opposite bottom surface region at a central portion of the surfboard for holding the surfboard at the central portion substantially immovable side-to-side.

4,296,879

BIKE CARRYING ADAPTER

Harold G. Jordening, 1541 E. La Palma, A-3, Anaheim, Calif. 92805

Filed Aug. 29, 1980, Ser. No. 182,477
Int. Cl.³ B60R *9/10*
U.S. Cl. 224—42.45 R **4 Claims**

1. A device for adapting a vehicle mountable bicycle carrier capable of carrying one size bicycle to permit the carrier to carry bicycles of various sizes comprising:

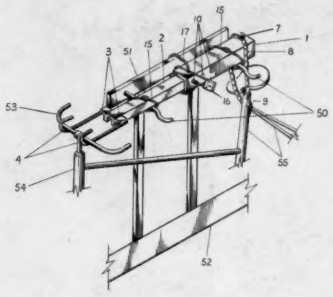
(a) an extensible support member,

(b) means for securing the length of the extensible support member at a selected one of a plurality of selectable lengths,

(c) means for fastening the extensible support member to a vehicle-mountable bicycle carrier,

(d) means near the rear end of the extensible support member for supporting the rear portion of a bicycle, and

(e) means near the front end of the extensible support member for supporting the handle bars of a bicycle, said bicycle handle bar supporting means, comprising a pair of parallel J-hooks fastened to either side of the extensible support member near said front end of the extensible



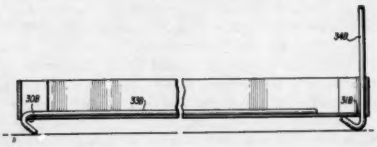
support member, the J-hooks extending outward from said front end of the extensible support member with the long straight portions of the J's parallel to the axis of extensibility of the extensible support member and the U-shaped ends of the J-hooks lying in parallel vertical planes on opposite sides of the extensible support member with the interior portions of the U-shaped ends facing towards the rear end of the extensible support member.

4,296,880

COMBINATION STORAGE AND CARRYING DEVICE

Frank A. Olshefsky, 3578 Guilderland Rd., Schenectady, N.Y. 12306

Filed Jul. 2, 1979, Ser. No. 53,863
Int. Cl.³ A47G *23/06*
U.S. Cl. 294—144 **10 Claims**



1. A combination storage and carrying device for transporting and storing a quantity of firewood and the like, and comprising:

a substantially flat base portion having first and second pairs of spaced apertures extending therethrough;

a first handle member positioned on an upwardly facing side of said base portion and having a pair of separate leg sections extending through and beyond said first pair of apertures to a downwardly facing side of said base portion, and a second handle member also positioned on said upwardly facing side of said base portion and having a pair of separate leg sections extending through and beyond said second pair of apertures;

each leg section extending through and beyond one of said apertures including first and second portions having longitudinal axes forming an acute angle, and a third, smoothly curved portion joining said first and second portions to one another, whereby the first portions of a pair of leg sections forming a handle member rest against the upwardly facing side of said base portion and the second portions contact a storage support surface to elevate said

base portion above said storage support surface when said respective handle member assumes a fully reclined position, whereby the third portions of each pair of leg sections forming a handle member contact the storage support surface and the second portions each contact a downwardly facing side of said base portion to elevate said base portion above said support surface when said respective handle member assumes a fully open position;

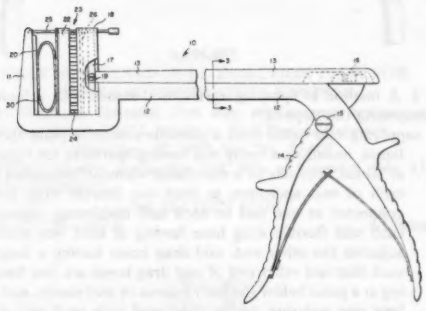
side wall means extending from predetermined locations on the upwardly facing side of said base portion for resisting pivotal movement of said first and second handle members away from said upwardly facing side of said base portion beyond a predetermined location corresponding to their fully open positions.

4,296,881

SURGICAL STAPLER USING CARTRIDGE

Sukoo Lee, 30 Widewaters La., Pittsford, N.Y. 14534

Filed Apr. 3, 1980, Ser. No. 136,785
Int. Cl.³ B27F *7/00*; A61B *17/04*
U.S. Cl. 227—30 **6 Claims**



1. A surgical stapling tool using disposable cartridge elements and having a staple folding anvil, an actuator movable toward and away from said anvil, a holder for an array of staples oriented toward said anvil, and a pusher for pushing said staples from said holder through tissue to be stapled and against said anvil, said tool comprising:

a. said movable actuator and said staple pusher being shaped relative to each other so said pusher mounts on said actuator in a retention fit and moves with said actuator toward said anvil;

b. said holder being shaped for a retention fit on said pusher for movement with said pusher independently of said actuator and said anvil;

c. said pusher being movable relative to said holder by force overcoming a predetermined frictional resistance between said pusher and said holder; and

d. said actuator being movable through a distance sufficient to advance said pusher and said holder until said holder presses against and is stopped by tissue supported by said anvil and then continuing to advance said pusher into said holder to drive said staples through said tissue and against said anvil to staple said tissue.

4,296,882

CENTRIFUGAL FLUID PROCESSING DEVICE

Susumu Kobayashi, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,188
Claims priority, application Japan, Feb. 26, 1979, 54-21716
Int. Cl.³ B04B *11/00, 9/08*
U.S. Cl. 233—21 **16 Claims**

1. A centrifugal fluid processing device comprising:

a stationary base;

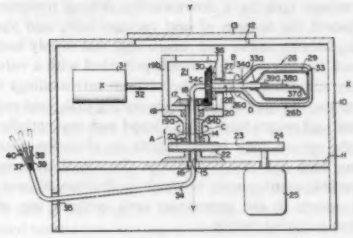
a vertically extended support mounted on said stationary base and having a vertical axis;

a rotor rotatably supported on said vertically extended support and being rotatable about the vertical axis of said vertically extended support;

a rotor drive assembly coupled to said rotor;

fluid processing container means rotatable along with said rotor about said vertical axis and being further rotatable independently of said rotor about an axis of rotation disposed radially or perpendicular to said vertical axis;

a flexible communication conduit which has one end thereof



extended into said fluid processing container means and the other end thereof led to the outside of the device and through which a fluid to be processed is fed into said fluid processing container means, said flexible fluid communication conduit comprising at least a radially extending section which extends along said radially disposed axis of rotation and a vertically extending section which extends along said vertical axis of said vertically extended support; and

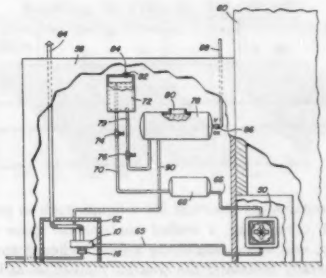
means to drive said fluid processing container means for rotating the same about said radially disposed axis of rotation.

4,296,883

HEAT GENERATION AND DISTRIBUTION SYSTEM

Andrew F. Yanna, 4389 Jean Rd., Bay City, Mich. 48706

Filed May 18, 1979, Ser. No. 40,457
Int. Cl.³ F24D *3/00*
U.S. Cl. 237—59 **7 Claims**



1. In combination with a heat source, a closed heat distribution system for delivery of heat from the heat source to a location of use for dissipation of heat below or level with the heat source wherein the system contains a liquid heat transfer medium, a generating tank adjacent said heat source and containing said liquid medium for absorption of heat by the liquid medium, radiator means for withdrawal of heat from the liquid medium and delivery of heat to the location of use, the radiator means being located in a horizontal or downwardly sloping run from said generating tank and being connected thereby to

the generating tank, a return tank connected to the radiator means for receiving the output of liquid medium from the radiator means, a vacuum tank for receiving the output of liquid medium from the return tank, said vacuum tank having a vacuum space adjacent the tanktop, said output being received within the vacuum space and a supply tank for receiving the output of liquid medium from the vacuum tank and for feeding liquid medium to the generating tank, said supply tank being connected to the generating tank by a connecting line which extends upwardly into the supply tank and has an opening within the space defined inside the supply tank, said supply tank being open to ambient surroundings and being connected to the vacuum tank by a downwardly sloping traverse pipe from adjacent the bottom of said vacuum tank, said vacuum tank being located above said return tank and supply tank and is enclosed, having covering means provided with a valve for selectively admitting air from the ambient surroundings to the interior of the vacuum tank, said generating tank, said radiator means and said return tank being closed and sequentially connected, the return tank being higher in elevation than the generating tank and radiator means, the distribution system being operable continuously through application of heat from the heat source to the generating tank without use of any mechanical pumping means.

4,296,884

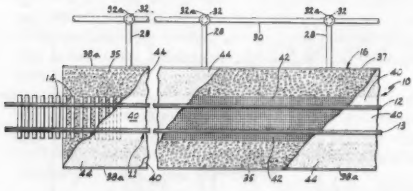
CONTAINMENT RESERVOIR AND METHOD

Robert W. Luebke, Hudson, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Jan. 23, 1979, Ser. No. 5,699

Int. Cl.³ E01B *2/00*; E02D *27/48*

U.S. Cl. 238—2 **19 Claims**



1. A containment reservoir for a liquid, such as petroleum based oil, comprising, a walled containment space opening upwardly, said space containing a flexible liquid impervious liner generally following the contour thereof, in at least one direction thereof, said liner comprising a layer of liquid pervious fabric material having on at least one of its sides an attached layer of liquid impervious material, such as rubber, which is resistant to oil degradation, said liner being operable to prevent escape of liquid from said reservoir through said liner from said containment space, a relatively coarse particle bed located on said liner and filling said containment space, a layer of liquid pervious flexible fabric filter material supported on said bed and covering the open top of said bed, and means coacting with said liner covered containment space for removing liquid therefrom.

4,296,885

PROCEDURE FOR THE CAREFUL APPLICATION OF LIQUIDS TO PLANTS IN AGRICULTURAL STANDS

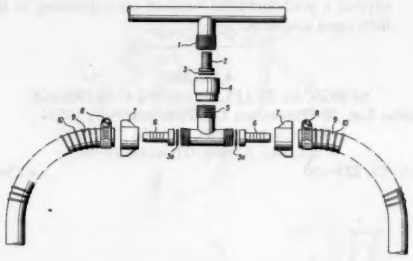
Jürgen Norden, Bochum, and Bruno Ucinhazska, Dülmen, both of Fed. Rep. of Germany, assignors to Ruhr-Stickstoff Aktiengesellschaft, Bochum, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 103,542

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853773

Int. Cl.³ A01C *23/00*

U.S. Cl. 239—1 **18 Claims**



1. A method of spraying agricultural stands with a liquid, comprising the steps of:

supplying said liquid from a portable source of plant spray liquid, including a spray rod having apertures for liquids at 50 cm intervals to a distributor element connected to each of said apertures, at least one flexible drag hose connected at one end to each said distributor element, each said flexible drag hose having at least one nozzle adjacent the other end, said drag hoses having a length such that said other end of said drag hoses are free hanging at a point below the leafy rooves of said stands, and at least one metering device associated with each said distributor element; and

feeding said liquid to said agricultural stands from said nozzles,

whereby the leafy rooves of said stands are not damaged by said liquid.

4,296,886

SHOWER FITTINGS

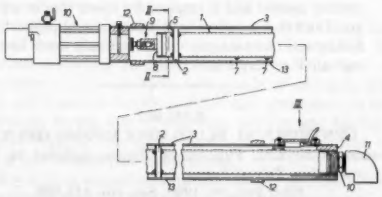
Lionel T. Bloyce, Maidenhead, and Michael J. Morley, Bray, both of England, assignors to Albany International Corporation, Albany, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,292

Claims priority, application United Kingdom, Sep. 21, 1978, 37666/78

Int. Cl.³ B05B *3/18*

U.S. Cl. 239—264 **4 Claims**



1. A shower fitting comprising in combination a first tubular member with an interior passageway therethrough, closure means at one end of said passageway, fluid connection means positioned at the other end of said first member to enable the

passageway to be connected to a source of fluid, a series of aligned spray jets mounted upon the said first tubular member at spaced intervals along the length thereof and being in communication with said passageway, a second tubular member, said first tubular member being housed within said second tubular member, said spray jets being wholly contained within said second tubular member, support means at the ends of said second tubular member, further support means located at spaced points along the length of said first tubular member and being secured to the latter, said support means and said further support means supporting said first tubular member within said second tubular member for reciprocatory movement relatively thereto, a longitudinal slot in said second tubular member, said slot being aligned with said spray jets and permitting fluid discharged therefrom to emerge from said second member, driving means mounted upon said second tubular member, and drive connection means extending within the second member from the driving means to said closure means to impart reciprocatory movement to said first tubular member.

4,296,887

HEAT PROTECTED FUEL INJECTION PLUG FOR INTERNAL COMBUSTION ENGINES

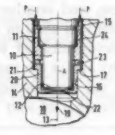
Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

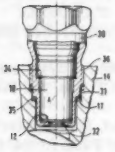
Filed Sep. 17, 1979, Ser. No. 75,907

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 7827497[U]

Int. Cl.³ F02N *61/14*

U.S. Cl. 239—397.5 **4 Claims**





1. Heat protection construction for a fuel injection plug (**10**), adapted for insertion into an opening (**15**, **16**) in the cylinder block (**14**) of a Diesel internal combustion (IC) engine,

wherein the plug has an end surface (**12**) facing the combustion chamber of the engine and a fuel injection opening formed in said end surface;

and comprising a bushing (**20**, **30**) surrounding the plug in the region of the injection opening thereof, said bushing integrally including, in accordance with the invention,

an external flange (**21**, **31**) fitting against a matching seat (**17**) formed in the opening (**15**, **16**) of the cylinder block,

and a resiliently deformable terminal sealing lip (**22**, **32**) integrally connected with said external flange and formed as an in-turned inwardly directed resilient flange portion overlapping a portion of the terminal end face surface (**12**) of the plug (**10**) and in resilient sealing and heat protecting engagement with said terminal end face surface.

4,296,888

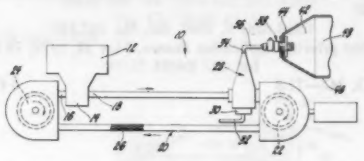
POWDERED COAL AIR DISPERSION NOZZLE

Thomas P. Kosek, East Detroit, and Eric A. Steinhilper, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1980, Ser. No. 125,469

Int. Cl.³ B05B *7/10*

U.S. Cl. 239—403 **4 Claims**



1. A powdered coal/air dispersion nozzle for introducing a fluidized coal/air fuel mixture as a finely atomized dispersed spray for uniform combustion in a gas turbine engine combustor apparatus comprising: an elongated nozzle tube having an inlet for connection to a fluidized coal/air source with a coal particle size in the range of one to three hundred microns, said elongated nozzle tube having an outlet therefrom, scroll means including a sheet element located within said nozzle tube having spaced longitudinal edges thereon in engagement with said tube, said sheet element having a thin cross-section at all points throughout the twisted length thereof to prevent build-up of coal particles through the length of said scroll means, said sheet element being twisted along its length to impart a continuous swirl to the fluidized coal/air fuel mixture supplied to the inlet and said sheet element having a length-to-width ratio greater than one to impart a swirl in the fluidized coal/air mixture which is sustained as the fluidized coal/air fuel mixture is directed from said outlet, and pintle means overlying said outlet and operative to direct said sustained swirl of the fluidized coal/air mixture as a spray cone for combustion within the combustor.

4,296,889

METHOD AND APPARATUS FOR WINDING TEXTILE YARNS

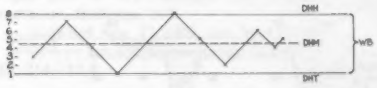
Gerhard Martens, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,969

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855616

Int. Cl.³ B65H *54/38*

U.S. Cl. 242—18.1 **40 Claims**



1. In a method of winding textile yarns into core-supported packages in which the yarn is wound about the core at a substantially constant rate while the yarn is guided onto the core by a traversing yarn guide and in which the traverse motion speed of the yarn guide is continually changed by accelerating and decelerating the traverse motion of the yarn guide, the improvement therein comprising changing aperiodically the traverse motion speed of the yarn guide by varying aperiodically at least one of the time intervals between switching from acceleration to deceleration or vice versa, the rate of acceleration and/or deceleration and the traverse motion speed attained between switching from acceleration to deceleration or

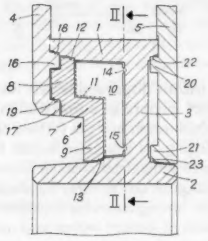
vice versa to prevent undesirable pattern formation in the yarn windings in the package formed thereby.

4,296,890

PROCESS FOR THE SIMPLIFIED PACKING OF A MAGNETIC TAPE FOR COMPUTER AND WINDING CORE FOR CARRYING OUT THIS PROCESS

Patrick Posso, 10, Avenue Jurigoz, Lausanne, Switzerland (CH-1006)

Filed May 7, 1980, Ser. No. 147,520
Claims priority, application France, May 14, 1979, 79 12221
Int. Cl.³ B65H *75/18*
U.S. Cl. 242—71.8 **6 Claims**



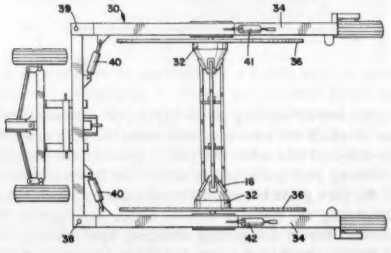
1. Process for the simplified packing of a magnetic tape for a computer consisting in delivering large width magnetic film under tension, in splitting this film lengthwise into a plurality of tapes having the required width, in providing a plurality of cores, in winding each tape on a core and in mounting on this core when it is filled with tape at least one side element in order to constitute a packing spool, this process making it possible to eliminate the operation of rewinding the tape stored around a core in a preconstituted spool, each core comprising a peripheral tubular ring for winding and a central drive hub, concentric with respect to each other and connected together by a web, each core further comprising reinforcing means disposed in the free space existing between said ring and said hub over virtually the whole width of said core, in order to ensure the strength and precision of the core, and each core also comprising means for mounting said side element on on the side of said core.

4,296,891

EXPANDABLE CORE FOR ROLLS OF TUBING

H. John Sidaway, Findlay, Ohio, and Maynard Good, Elkhart, Ind., assignors to Hancor, Inc., Findlay, Ohio

Filed Feb. 4, 1980, Ser. No. 118,085
Int. Cl.³ B65H *75/24, 75/40*
U.S. Cl. 242—110 **19 Claims**



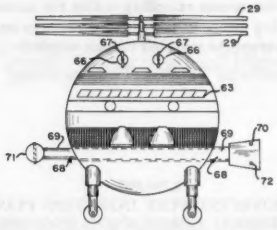
1. An expandable reel for rolls of tubing comprising a base rod extending generally along the longitudinal axis of said reel; a plurality of support members disposed radially outwardly from said base rod and extending substantially parallel thereto; a plurality of connecting links extending between and operatively connecting said support members and said base rod, said links hingedly connected to a first point along the length of said links for pivotal movement about a hinge; camming surfaces at the terminal ends of said support members; and, means for selectively expanding said reel from a first to second expanded position adapted to engage said camming surfaces.

4,296,892

SPHERICAL LIVING MODULE OR SPACE

Presley O. Barge, 2868 Pine Pl., St. Louis, Mo. 63115

Filed Jan. 2, 1979, Ser. No. 26
Int. Cl.³ B64C *35/00, 37/00, 39/02*
U.S. Cl. 244—2 **2 Claims**



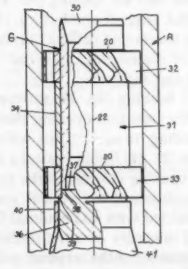
1. A substantially spherical self-propelled human living space comprising a shell, a plurality of elongated coaxial shafts journalled for rotation in said shell and projecting radially therefrom, helicopter blades mounted on said shafts outside said shell, and means within said shell for rotating said blades; and elongated pontoons, a set of said pontoons projecting chordally from said shell, spaced apart and parallel to one another, in one direction, and another set of said pontoons projecting chordally from said shell in the opposite direction, said sets of pontoons being aligned with one another, and coupling means carried by and at the ends of said pontoons, for engaging and coupling the complementary coupling means carried by pontoons of another of said living spaces.

4,296,893

PROJECTILE WITH SPIN-PRODUCING FLOW PASSAGES

Josef Ballmann, Oberforstbacher Str. 228, D-5100 Aachen, Fed. Rep. of Germany

PCT No. PCT/DE78/00007, § 371 Date Mar. 9, 1979, § 102(e) Date Mar. 8, 1979, PCT Pub. No. WO79/00038, PCT Pub. Date Feb. 8, 1979
PCT Filed Jul. 3, 1978, Ser. No. 21,606
Int. Cl.³ F42B *13/24, 15/14*
U.S. Cl. 244—3.23 **12 Claims**



1. A projectile for shooting from a gun barrel in response to

the force of a propellant gas emanating from the aperture of a propellant container, comprising a projectile body having a plurality of spin-producing propellant gas flow passages associated therewith, said passages annularly surrounding, and having their respective axes extending obliquely to, the longitudinal axis of the projectile body, wherein each passage has an inlet portion converging to an adjoining constricted portion, and a diverging portion extending downstream from the constricted portion, the axis of each passage being curved over the entire length of its converging inlet portion and substantially rectilinear over its diverging portion, and the walls of the diverging portion of each passage having a substantially rectilinear form, as viewed in the direction of propellant gas flow.

4,296,894

DRONE-TYPE MISSILE

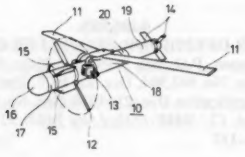
Werner Schnäbele, Wolfratshausen; Jack Buckley, Albaching, and Ulrich Rieger, Feldkirchen-Westerham, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,720

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904749

Int. Cl.³ F42B *13/32, 15/16*

U.S. Cl. 244—3.27 **8 Claims**



1. A drone missile system, comprising:
a missile having a target-seeking head,
a guidance system,
a self-propulsion and take-off system,
electronic means for storing individual mission data prior to the mission,
a pair of wings,
a tail assembly, and
a propeller,
said missile having a shape defining a longitudinal direction,
said wings, as well as said tail assembly and said propeller being foldable in the longitudinal direction of the missile and automatically unfoldable transverse to the longitudinal direction of the missile,
said wings and said propeller being automatically detachable in flight after launching, and
a container for storing as well as transporting and launching the missile when the wings as well as said tail assembly and said propeller are folded in the longitudinal direction.

2. A drone missile system, comprising:
a missile having a target-seeking head,
a guidance system,
a self-propulsion and take-off system,
electronic means for storing individual mission data prior to the mission,
a pair of wings,
a tail assembly, and
a propeller,
said missile having a shape defining a longitudinal direction,
means for allowing folding of said wings as well as said tail assembly and said propeller in the longitudinal direction of the missile and for automatically unfolding them transverse to the longitudinal direction of the missile,
means for automatically detaching said wings and said propeller in flight after launching, and
a container for storing as well as transporting and launching the missile when the wings as well as said tail assembly and said propeller are folded in the longitudinal direction.

4,296,895

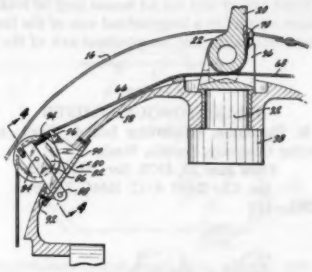
FIN ERECTION MECHANISM

Ladislao Pazmany, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Jan. 15, 1979, Ser. No. 3,358

Int. Cl.³ F12B *15/16*

U.S. Cl. 244—3.29 **7 Claims**



1. Fin erection mechanism for a missile having a longitudinally cylindrical body frame and a plurality of foldable fins for flight control comprising,
means longitudinally of said missile for connecting said fins to said missile,
means for bracing said fins toward an erect position,
means for interconnecting said fins together so that erection of all of said fins occurs simultaneously, said means for interconnecting comprises cable means for connecting one fin to fins located on each side of said one fin so that erection of said one fin influences the erection of said finds located on each side of one fin,
each fin of said fins is formed with a pulley means and wherein said cable means is attached and guided by said pulley means during the erection of said fins, and
control means disposed radially of said main axis of said missile for rotating said fins while erected for flight control and wherein said pulley means is located on the axis of rotation of said control means so that said cable means do not interfere with limited rotation of said fins.

4,296,896

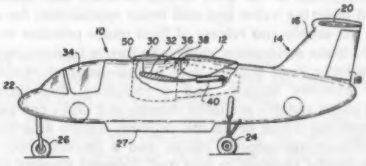
VTOL AIRPLANE

Robert W. Kress, Lloyd Harbor, and Anthony C. Bacchi, Massapequa, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,260

Int. Cl.³ B64C *29/00, 15/12*

U.S. Cl. 244—12.4 **6 Claims**



1. An airplane and powerplant combination comprising:
an airplane fuselage;
a stub wing mounted through said fuselage so as to be movable relative thereto;

fan jet means mounted to said stub wing at least one on either side of said fuselage;

an airplane wing joined to said fuselage behind said stub wing with said fan jet means extending from ahead of said stub wing, under the airplane wing to a position adjacent the trailing edge of the airplane wing;

a pivot arm means fixed to said stub wing;

a means to connect said pivot arm means to said fuselage so as to rotate about an axis above said stub wing;

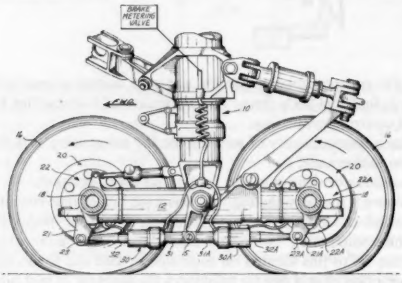
an actuator connected between said fuselage and said stub wing to rotate said stub wing about the axis above said stub wing in positioning said fan jet means in a plane ahead of, and normal to the chord of the airplane wing whereby the thrust axis of said fan jet means may be rotated from a position parallel to a longitudinal axis of the fuselage to a position normal to said longitudinal axis of the fuselage.

4,296,897

BRAKE TORQUE LIMITER

Bernard B. Thompson, Bainbridge Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 22, 1979, Ser. No. 5,253
Int. Cl.[3] B60T *8/12;* **B64C** *25/46*
U.S. Cl. 244—111 **6 Claims**



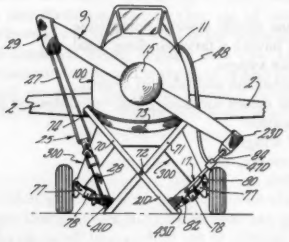
1. A torque responsive brake control apparatus for controlling a fluid pressure operated brake mechanism, operatively connected to a rotatable member, comprising: said fluid pressure operated brake mechanism being mounted substantially coaxial with said rotatable member and adapted for exerting a braking force to resist rotation of said rotatable member; a metering valve being manually operated for controlling a flow of pressurized fluid to said brake mechanism; a torque arm connected to said brake mechanism; said torque arm being angularly movable in response to brake reaction torque associated with said rotatable member when a braking force is applied to resist rotation of said rotatable member; said torque responsive control apparatus having a brake rod assembly attached at one end to said torque arm and attached at an opposite end to a fixed support; said brake rod assembly being arranged between said torque arm and said fixed support, for resisting angular displacement of said torque arm; a brake torque limiter incorporated within said brake rod assembly and being interposed in the fluid circuit between said manually operated metering valve and said brake mechanism, for controlling the supply and release of fluid under pressure to and from said brake mechanism; said brake torque limiter comprising a cylinder head section with a dual-diameter internally stepped cylinder section, and a matching dual-diameter stepped piston slidably mounted therein; said brake rod assembly comprising a first brake rod segment fixedly attached to said dual-diameter stepped piston, and a second brake rod segment fixedly attached to said dual-diameter stepped cylinder and head section of said brake torque limiter; a first chamber formed between said cylinder head section and said dual-diameter stepped piston; said brake torque limiter being constructed and arranged with respect to said brake rod assembly, so as to normally bias said brake rod assembly in one direction of extending said brake rod assembly to its maximum overall length, by directing fluid pressure from said manually operated metering valve into said first chamber, and in the opposite direction for decreasing the overall length of said brake rod assembly by torque resulting from application of brakes; a control valve incorporated within said brake torque limiter and interposed in the fluid circuit through which fluid under pressure from said manually operated metering valve, is supplied to the brake mechanism; said control valve being normally in an open position, when said brake rod assembly is at its maximum overall length, for circulating fluid pressure from said metering valve through said control valve to said brake mechanism; said control valve being actuated to a closed position, when said brake rod assembly is decreased from its maximum overall length by predetermined excessive braking torque of said rotatable member, for blocking fluid flow between said brake mechanism and said manually operated metering valve, and for trapping metered fluid pressure between said brake torque limiter and said brake mechanism; a second chamber formed between said step sections of the dual-diameter piston and matching internal dual-diameter cylinder, for creating an expanding annulus volume in response to contraction of the overall length of said brake rod assembly, to receive hydraulic fluid trapped between said brake torque limiter and said brake mechanism, and thereby decrease the pressure of said trapped hydraulic fluid resulting in a decrease in the ratio of brake torque reaction relative to metered hydraulic pressure.

4,296,898

ANCHOR DEVICE FOR PROPELLER ROTATOR

Ronald S. Watson, P.O. Box 9599, San Diego, Calif. 92109

Division of Ser. No. 863,984, Dec. 23, 1977, Pat. No. 4,131,249.
This application Dec. 21, 1978, Ser. No. 974,169
Int. Cl.[3] B64F *1/12, 1/16;* **B64D** *31/04*
U.S. Cl. 244—115 **14 Claims**



1. An anchor means for placing between a forward portion of a propeller driven aircraft and a landing surface including, a section of said anchor means located behind the plane of a propeller of said aircraft and engaged by said aircraft to hold the anchor means fixedly against said landing surface, a pair of arms extending forwardly from said section held by said aircraft, said arms having forward ends for positioning substantially under a propeller, said forward ends of said arms having holding means for positioning substantially under the center mounting of the propeller adapted to be connected to said propeller.

4,296,899

APPARATUS AND METHOD FOR MANUFACTURING LAMINAR FLOW CONTROL AIRCRAFT STRUCTURE

Jack M. Isenberg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

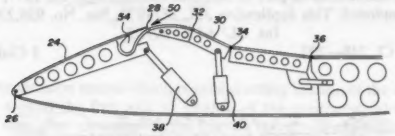
Continuation of Ser. No. 811,744, Jun. 30, 1977, Pat. No. 4,171,785. This application Feb. 26, 1979, Ser. No. 15,085
Int. Cl.[3] B64C *3/26, 21/06*
U.S. Cl. 244—207 **6 Claims**

1. A self-positioning slot assembly tape for defining a pas-

sageway for boundary layer air on an aircraft having a laminar flow control means comprising:

a removable cover plate having an upper and a lower surface; and

a pair of sidewall members each including an upper surface removably bonded to the lower surface of said cover plate with a first adhesive and spaced apart a predetermined



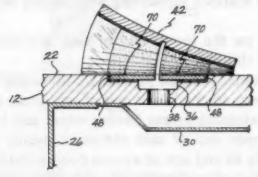
distance so as to form a continuous longitudinal slot of uniform width therebetween for passage of boundary layer air to said laminar flow control means, said removable cover plate providing means for maintaining a fixed spacing between said sidewalls and having sufficient transverse rigidity for maintaining a coplanar relationship between the respective upper surfaces of said sidewalls.

4,296,900

AIRFOIL CONSTRUCTION

Kenneth M. Krall, Arlington, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Apr. 23, 1979, Ser. No. 32,438
Int. Cl.³ B64C *3/48*
U.S. Cl. 244—219 **4 Claims**



1. An airfoil construction, comprising:

(a) upper and lower surface structure which connects leading and trailing edges so as to form a relatively thin profile which is adapted to foster high speed flight, with one portion of the upper surface structure being pivotable upward about a hinge line that coincides generally with the leading edge of the airfoil, for increasing the thickness of the airfoil, and the chordwise length of said pivotable portion being substantially less than the chord length;

(b) a connecting section which forms part of the airfoil upper surface structure immediately aft of the pivotable portion, and said section being positionable for presenting a substantially continuous and rigid surface to the air moving over the upper surface structure during such times as the pivotable portion is being pivoted upward and downward, and the connecting section cooperating with the remainder of the airfoil upper surface when the connecting section is lowered to establish an elongated convex cross section for high speed fight, and the connecting section also cooperating with the remainder of the airfoil upper surface when the connecting section is fully raised to establish a compound curvature having both concave and convex portions for fostering low speed flight;

(c) a rearwardly directed nozzle located adjacent the aft edge of the pivotable portion and oriented such that it can discharge a gaseous fluid over the connecting section;

(d) a source of pressurized fluid adapted to be connected with said nozzle; and

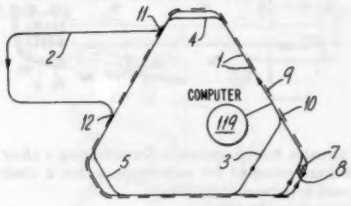
(e) control means for adjusting the discharge of fluid from said source over the connecting section.

4,296,901

TRANSPORTATION SYSTEMS

Francis C. Perrott, The Manor House, South Cerney, Cirencester, Gloucestershire, England

Filed Jan. 2, 1980, Ser. No. 109,182
Claims priority, application United Kingdom, Jan. 2, 1979, 00046/79; Apr. 27, 1979, 14658/79; Sep. 29, 1979, 33865/79
Int. Cl.³ B61L *3/00*
U.S. Cl. 246—167 R **12 Claims**



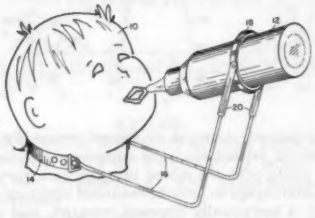
1. A transportation system comprising a track, driven vehicles movable along the track, and control means for generating control signals effectively defining a series of spaced control areas movable along the track, each control area being of such length as to be capable of accommodating a plurality of vehicles simultaneously, wherein each vehicle is provided with on-board detection means responsive to the control signals for maintaining the vehicle within the confines of a control area, and the control means includes vehicle closing means for sensing the presence of gaps between a plurality of vehicles confined within a single control area and for causing relative movement of said vehicle with respect to one another to close up the gaps.

4,296,902

BABY BOTTLE SUPPORT JIG

William G. Dachtler, 1021 Emory, Imperial Beach, Calif. 92032

Filed Sep. 10, 1979, Ser. No. 74,004
Int. Cl.³ A47D *15/00*
U.S. Cl. 248—102 **5 Claims**



1. A baby bottle support jig comprising:

(a) a soft strap to loop over the head and pass behind the neck of a baby in a reclining position;

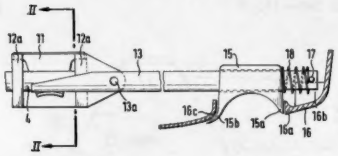
(b) a pair of substantially rigid support arms having ends lying alonside the opposite sides of the neck and being connected respectively to the ends of said strap, passing down in contact with the baby's chest, and extending to upper ends spaced from the baby's face and chest; and

(c) a bottle-holding cradle mounted to the upper ends of said support arms, whereby a baby bottle with the nipple thereof in the baby's mouth can be supported at its upper portion in said cradle.

4,296,903
ACTUATOR BUTTON APPARATUS FOR ADJUSTABLE CHAIRS

Hans J. Edel, Minden, Fed. Rep. of Germany, assignor to Drabert Söhne Minden, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,610
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 7831578[U]
Int. Cl.[3] F16M *11/00;* A47C *3/22*
U.S. Cl. 248—162.1 8 Claims

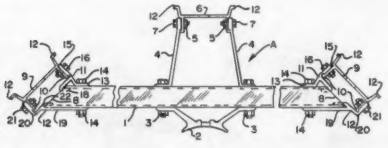


1. An actuator button apparatus for actuating a chair positioning linkage mounted for movement within a chair base housing, said apparatus comprising:
an aperture in said housing;
a linkage element mounted for movement within said housing;
an actuator button moveable within said aperture, said button being slidably mounted on said linkage element and adapted for movement with said linkage element at least partially into said housing and then along said linkage element at an angle transverse to the initial direction of pressure exerted to move said button into said housing; and
means located within said housing for releasably retaining said button after said button has been pressed into said housing and moved along said linkage element.

4,296,904
ELECTRICAL EQUIPMENT MOUNT

Marion R. Farmer, Germantown, Tenn., assignor to Aluma Form, Inc., Memphis, Tenn.

Filed Aug. 9, 1979, Ser. No. 65,076
Int. Cl.[3] E04G *3/00*
U.S. Cl. 248—218.4 9 Claims

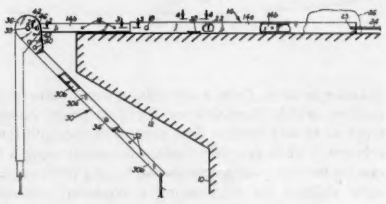


1. An improved electrical equipment mount for holding transformers or related electrical equipment and for attachment to a utility pole, the mount being formed from components that interengage to provide enhanced structural support, comprising, a horizontally disposed crossarm, said crossarm fabricated having a channel member and including front and back surfaces and end edges, means for holding said crossarm to a utility pole, a bracket having a mounting pad connecting to each end of the crossarm, said bracket being mounted to the crossarm and disposed for orienting its held transformer towards the front, rear, or side of the equipment mount, each crossarm end being formed to accommodate the mounting of its associated bracket in its desired disposition, connectors securing with the front and back edges of each end of the crossarm for securing its respective bracket to the crossarm end, the connector securing with the back end edge of the crossarm including a first leg, said leg provided for abutting against the back surface of the crossarm and capable of being secured thereto, an integral second leg extending angularly from the first leg of the connector, and said second leg securing with the bracket for retention of the same.

4,296,905
BUILDING SCAFFOLD SUPPORT

Charles R. Powell, 6729 N. Richmond Ave., Portland, Oreg. 97203

Continuation-in-part of Ser. No. 836,027, Sep. 23, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,237
Int. Cl.[3] A47G *29/02*
U.S. Cl. 248—237 3 Claims



1. A scaffold support for buildings comprising
(a) an elongated base member having front and rear end portions and arranged to lie on a top surface of a building with said front end portion projecting beyond a side of the building,
(b) means on said base member arranged to hold it down on a building,
(c) rigid plate means depending integrally from the front end of said base member,
(d) a rigid scaffold supporting arm having upper and lower ends,
(e) means on the lower end of said arm for connecting a scaffold thereto,
(f) pivot support means pivotally connecting the upper end of said arm to the lower end of said plate means,
(g) rigid extension means having upper and lower ends,
(h) the lower end of said extension means being secured integrally to said arm at a point downward from said pivot connection of said arm with said plate means,
(i) said extension means extending upwardly along a rearward side portion of said plate means,
(j) said rearward portion of said plate means having a pin receiving aperture above said base member and said extension means having a plurality of spaced pin receiving apertures,
(k) and cross pin means arranged for removable mounting in the apertures in said plate means and in said extension means to provide selected angular disposition of said arm relative to said base member.

4,296,906
DEVICE HAVING A BALANCED PIVOTABLE ARM

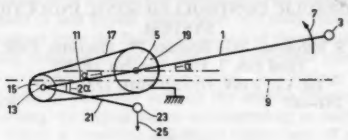
Matthijs Matthijsse, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,423
Claims priority, application Netherlands, Sep. 29, 1978, 7809850
Int. Cl.[3] E04G *3/00*
U.S. Cl. 248—280.1 4 Claims

1. A counterbalancing device comprising:
a first axle (5);
an arm (1) pivotably affixed for rotation around the first axle in a first plane;
a second axle (9) disposed in the first plane perpendicular to the first axle;
means pivotably affixing the first axle and the arm for rota-

tion around the second axle so that the center of gravity of the arm is disposed on a first side of the second axle;

a counterweight (23) disposed on a second side of the second axle opposite the center of gravity of the arm; and



transmission means which couple pivoting motion of the arm around the first axle to motion of the counterweight so that the counterweight moves in an approximately straight line in the first plane when the arm is rotated around the first axle.

4,296,907

SUPPORT ASSEMBLY FOR AN EXHAUST SYSTEM OF A MOTOR VEHICLE

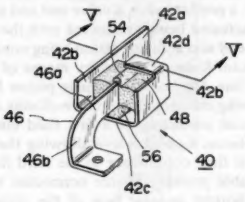
Takashi Ishida, Yokohama, and Mamoru Tanaka, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 29, 1979, Ser. No. 88,755

Claims priority, application Japan, Nov. 14, 1978, 53-156954[U]

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—573 **2 Claims**



1. A support assembly for an exhaust system of a motor vehicle, comprising:

(a) a first U-shaped bracket adapted to be mounted at one side to the body of the motor vehicle and provided with two substantially parallel spaced side walls in such a manner that the open side of said U-shaped bracket faces upwardly;

(b) a second bracket of substantially strip construction adapted for mounting at one end portion to the exhaust system and inserted at a second end portion between, and substantially parallel to, the two side walls of said U-shaped bracket in such a manner that the surface of said strip is normal to the bottom surface of the U-shaped bracket so as to form two spaces between the second end portion of the second bracket and each of the two side walls of the first bracket;

(c) two vibration absorbing members being inserted into the two spaces, the two members being respectively joined firmly to the second end portion of the second bracket and the two parallel side walls of the first bracket to absorb lateral and vertical vibrations of the second bracket;

(d) a stop extending from an upper portion of one of said two side walls toward the other side wall so as to prevent the movement of the second end portion of the second bracket beyond the stop; and

(e) a third vibration absorbing member disposed on one of the facing surfaces of said stop and said second end portion of said second bracket in such a manner that there is an appropriate spacing between the third vibration absorbing member and the other of said stop and said second end portion of said second bracket.

4,296,908

MOLD FOR INTEGRAL BASE FOR CASTING CERAMIC MATERIAL IN THE FORM OF A SLIP

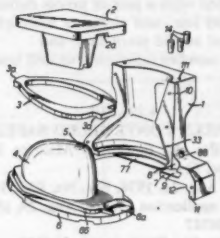
Giuseppe Lippa, Brescia, Italy, assignor to American Standard Inc., New York, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,792

Claims priority, application Italy, Aug. 8, 1979, 46864 A/79

Int. Cl.³ B29C *1/14*; B28C *7/06, 7/34, 7/16*

U.S. Cl. 249—58 **15 Claims**



1. A mold for casting ceramic material in slip form, which comprises a lower mold part resting on a support; at least two further mold parts adapted to be assembled with said lower mold part to define, in combination therewith, a cavity for casting and molding the article to be cast in the mold, said further mold parts including a removable ring and shelf portions on lateral mold members adapted to be positioned on said lower mold part to define the base of said cavity; said further mold parts being removable from said lower mold part after completion of the cast article so that the latter remains positioned on said lower part of the mold; said lower part bearing said ring to support said cast article on its lower rim in relation to its casting position, said ring being removably positioned on the inside of said lower part of the mold, and being supported by the lower part of the mold below said shelf portions so that, after casting, when the further mold parts have been removed from the lower mold part and the molded article, said ring may be lifted to contact said molded article so as to lift it out from the lower mold part.

4,296,909

APPARATUS FOR FORMING RECESS AROUND A PICKUP BOLT OF A CONCRETE BODY

Ernst Haeussler, Grashofstr. 47, 4300 Essen-Bredeney, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,925

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935825

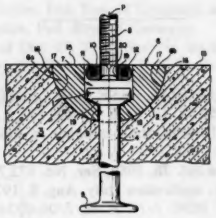
Int. Cl.³ B28B *7/04, 7/30, 7/16*

U.S. Cl. 249—94 **10 Claims**

1. An apparatus for forming in a concrete body during casting thereof a recess around the head of a pickup bolt having a stem inbedded in said body, said recess having a part-spherical inner surface, said apparatus comprising:

a pair of like elements each having an outer surface complementary to a respective half of said inner surface defined by a line bisecting said inner surface at said stem, said elements being formed with respective halves of a seat

complementarily surrounding said bolt head and stem in said recess;



a bridge provided with a pair of pivots defining pivot axes parallel to said line, said elements being pivoted on said bridge element at said pivot axes; and

a manipulating member connected to said bridge.

4,296,910

HYDRAULICALLY CONTROLLED SAFETY VALVE

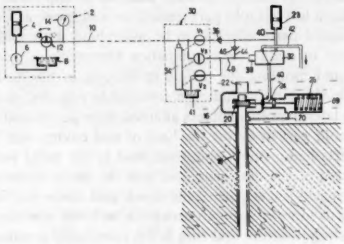
Jean L. Gratzmuller, 66 Boulevard Maurice Barres, 92200 Neuilly sur Seine, France

Filed Aug. 24, 1978, Ser. No. 936,510

Claims priority, application France, Aug. 29, 1977, 77 26157; Jul. 12, 1978, 78 20767

Int. Cl.[3] **F16K** *31/12, 31/122*

U.S. Cl. 251—28 **11 Claims**



1. In a safety valve control installation comprising:

a control station having a source of fluid under pressure;

a safety valve situated at a receiving station remote from said control station, said safety valve having a closure member;

a fluid operated jack attached to said closure member for actuating said closure member in an opening direction on pressurization of said jack;

resilient means acting in opposition to said jack for returning said closure member to the closed position when said jack is under low pressure;

a single small-section fluid flow line connecting the source of fluid under pressure at said control station to said receiving station and comprising, at said control station, a control valve permitting to selectively connect said line to said source or to a discharge means;

a fluid energy accumulator at said receiving station; and

a pressure-controlled feed/bleed relay connected between said accumulator and said actuating jack and having a control input;

the improvement comprising manostat means sensitive to the pressure in said line for successively actuating individual valve means which regulate, in response soley to said line pressure, a unidirectional communication of said line pressure with said accumulator, a closing of a communication of said relay control input with an outlet through one of said valve means in response to increased line pressure detected by said monostat means, and a communication of said line pressure through one of said valve means to said relay control input and unidirectionally to said accumulator in response to a further increase in line pressure detected by said monstat means.

4,296,911

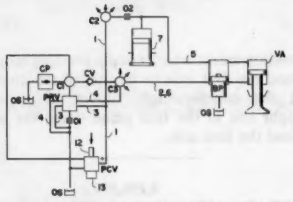
HYDRAULIC CONTROLLED SONIC INDUCTION SYSTEM

Alfonso S. Escobosa, 2034 Brittany Pl., Placentia, Calif. 92670

Filed Feb. 7, 1979, Ser. No. 10,001

Int. Cl.[3] **F16V** *31/122;* **F01L** *1/34, 9/02*

U.S. Cl. 251—57 **4 Claims**



1. A hydraulic controlled sonic induction system including a hydraulic actuation system adapted to provide a prescribed lift profile to engine intake valves, said actuation system receives hydraulic fluid for effecting the opening of each of the said intake valves by a cam follower piston, said hydraulic fluid conveyed to an actuator/port unit by means of a valve-opening control line, said actuator/port unit containing a single-ended, doubleacting valve actuator including, a piston, an actuator, an actuator cylinder, a poppet valve, a valve seat and a valve port, the shaft of said actuator being connected with the stem of the valve, the top face of said actuator piston being connected with the face of said cam follower piston by means of said valve-opening control line, the bottom annular piston face of said actuator piston being connected to a valve-closing circuit, said valve-closing circuit consisting of a first fluid compliance, a third fluid compliance, a check valve allowing the passage of fluid from the first fluid compliance to the third fluid compliance, and a variable pressure source connected to said first compliance, the bottom annular face of the actuator piston being connected to the third fluid compliance of the valve-closing circuit by means of a valve-closing control line, said variable pressure source comprising a hydraulic fluid charging pump, a pressure release valve, and a flow restricting orifice, said pressure release valve and said flow restricting orifice being in series with each other and being connected in shunt with the charging pump, the pressure relief fluid of said pressure release valve is returned to a oil sump, through said flow restricting orifice said cam follower piston, said actuator piston, and said actuator shaft define sliding surface clearances within the interior of said cylinder and forming finite leakage seals therewith, the actuator shaft finite leakage seal, in turn, divided into interior and exterior seals with leakage from the interior seal returned to the oil sump, a retractable elastomeric seal in series with the finite leakage interior shaft seal for the purpose of positively containing the interior (control) fluid and for latching each of the intake valves at some time during the engine turn-off period, another retractable elastomeric seal in series with the finite leakage seal of the cam follower piston again for the purpose of holding the interior fluid during the engine turn-off period, said hydraulic controlled induction system further includes lift control members for varying the opening of said intake valves, said control members comprising (1) a bypass piston contained in each of said intake valve actuator/port units and connected therein in parallel with the actuator piston through the valve-opening control line to a first bypass piston chamber and through the valve-closing control line to a second bypass piston chamber, (2) a flow distribution orifice connected to each of the valve-opening control lines, (3) a second fluid compliance means being connected to the flow distribution orifices that lead to the valve-opening control

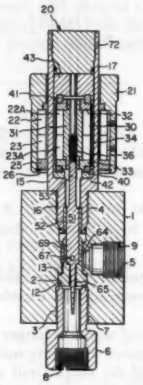
lines, and (4) a three-way pressure control valve, a supply pressure port thereof being connected to said first fluid compliance means, a return port thereof being connected to the oil sump and a control pressure port thereof being connected to said second fluid compliance means, the two sliding surface clearances of said bypass piston form two finite leakage seals with leakage from the finite leakage seal of the smaller diameter being returned to the oil sump, a retractable elastomeric seal in series with the smaller diameter finite leakage seal for the purpose of positively holding the interior (control) fluid and latching the bypass piston corresponding to each of the intake valves at sometime during the engine turn-off period.

4,296,912

MAGNETICALLY ACTUATED METERING VALVE

Robert F. Ruyak, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Aug. 30, 1979, Ser. No. 71,014
Int. Cl.³ F16K *31/08*
U.S. Cl. 251—65 **1 Claim**



1. A valve suitable for metering fluids pressurized in excess of 2000 psi comprising a pressurizable valve body defining a metering passage, a first fluid passage in communication with one of the metering passage and a second fluid passage in communication with the other end of the metering passage and a valve actuator passage extending away from the metering passage,

a nonmagnetic elongate cylindrical tubular pressurizable bonnet having an extending axis passing through the metering passage and in direct fluid communication with the passages in said valve body,

a cylindrical holder coaxial with and surrounding said tubular bonnet, said holder mounted rotatably thereto, said holder carrying rare earth cobalt magnets defining an even number of north and south poles,

a driven magnet assembly carrying rare earth cobalt magnets defining an even number of north and south poles rotatably supported in the bonnet substantially coaxial with said bonnet by thrust bearings to resist axial movement of the driven magnet assembly,

a valve stem substantially coaxial with said bonnet journaled for free axial movement in the valve actuator passage threadably engaging the driven magnet assembly,

a tapered metering element fixed to said valve stem which when moved axially enlarges or decreases the minimum area of the metering passage through which flow may take place, means for keying the valve stem to prevent rotation thereof,

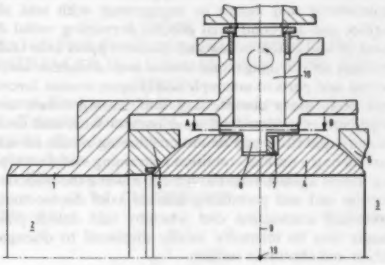
whereby rotation of said driven magnet assembly in one direction concomitantly raises the valve stem and rotation of said driven magnet assembly in the other direction lowers said valve stem.

4,296,913

BALL VALVE

Ernst H. J. Hoyer, Lohwurt 11, D-2000 Hamburg 57, Fed. Rep. of Germany

Filed Jun. 19, 1979, Ser. No. 49,882
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827720
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—76 **11 Claims**



1. A ball valve comprising:

a housing having inlet and outlet openings for a flow medium;

a perforated ball floatingly supported in a pair of rings in the housing for rotation about first and second rotary axes displaced from each other and extending through the center of the ball, said ball being rotatable about said first rotary axis to a first position in which the ball connects the inlet and outlet openings and to a second position in which the ball interrupts the inlet and outlet openings; and

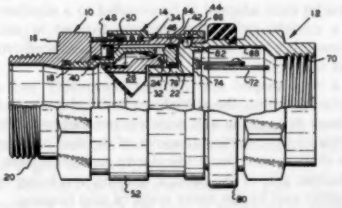
an actuator rotatable with the ball and in engagement therewith, said ball and actuator being so formed that their coaction is capable of imparting an initial movement to the ball about said second rotary axis for overcoming adhesion friction of the ball and thereafter imparts a rotation to the ball about said first rotary axis.

4,296,914

FULL FLOW BREAKAWAY COUPLING

Alan R. Allread, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 26, 1979, Ser. No. 107,152
Int. Cl.³ F16L *37/22, 37/28*
U.S. Cl. 251—149.2 **6 Claims**



1. A breakaway fluid coupling comprising, in combination, male and female body parts each having an axis, an axially extending passage, conduit attachment means in communication with the associated passage, a valve within the associated passage adapted to close upon the parts being uncoupled, a

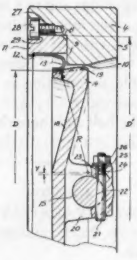
connection end, and latch means adapted to engage with the latch means defined on the other part for maintaining said parts in coupled intercommunication, said latch means defined on one part including a radially extending abutment surface facing said conduit attachment means of the associated part, a detent support axially slidably mounted on the other part between latched and release positions thereon, biasing means interposed between said other part and said detent support axially biasing said support toward said latched position, at least one radially displaceable detent mounted on said detent support adapted to engage said abutment surface upon said parts being coupled maintaining said parts coupled, detent positioning means defined on said other part having a first axial portion engaging said detent when said detent support is in said latched position maintaining said detent in engagement with said abutment surface and a second axial portion permitting radial displacement of said detent when said detent support is in said release position to disengage said detent and abutment surface and permit said parts to uncouple solely upon tension forces within said body parts compressing said biasing means to permit alignment of said second axial portion with said detent, and means supporting said detent positioning means on said other part having a normal condition restraining said detent positioning means against axial movement toward the associated connection end and permitting manual axial displacement away from said connection end whereby said detent positioning means may be manually axially displaced to disengage said detent and abutment surface.

4,296,915

ECCENTRIC ROTARY DISK VALVE WITH ELASTIC METAL SEAL

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Aug. 21, 1980, Ser. No. 179,944
Int. Cl.³ F16K *1/226*
U.S. Cl. 251—174 **5 Claims**



1. Eccentric rotary disk valve for tight shut-off purposes comprising:

a. tubular housing;

b. one inlet and one outlet formed in said housing, inlet and outlet ends adapted to be coupled to a pipeline;

c. a straight cylindrical passage formed in said housing towards a stop shoulder, forming a reduced cross section at that point;

d. a ring shaped seal retainer removably and adjustably placed within the straight cylindrical passage having an inner bore on an axis which is parallel to but offset from that of the exterior diameter of the seal retainer;

e. a shaft located perpendicular to and offset from the longitudinal axis of the tubular housing and being retained on either end by the outer walls of said housing;

f. an eccentric rotating disk tiltingly engaged with said shaft and within the reduced cross section of said housing, said disk having an annular continuous, partially spherical periphery forming a seating surface;

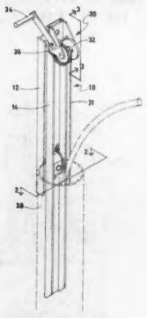
g. a flexible metal seal ring having a generally U-shaped cross-sectional configuration when viewed in the circumferential direction, wherein the outer straight portion of said U-shaped configuration is engaged within the inner bore of said seal retainer and suitably fastened to the same at its terminating end, while the inner straight portion of said U-shaped configuration forms a central circular seating bore to engage the eccentric disk in the closed valve position, the bottom portion of said U-shaped configuration facing said disk and the straight portions of said U-shaped configuration being generally parallel to said longitudinal axis of said tubular housing.

4,296,916

SUBMERSIBLE PUMP PULLER

M. Pearson Jewett, P.O. Box 442, Rockland, Me. 04841

Filed Nov. 26, 1979, Ser. No. 97,526
Int. Cl.³ B66D *3/00*
U.S. Cl. 254—380 **2 Claims**



1. A device for pulling a submersible pump from a well casing in which it is suspended by a cable, said device comprising

a pair of rails, one of which is longer than the other;

a threaded bolt, spacer and wing-nut assembly connecting the upper end of the shorter rail to the longer rail at a point spaced below the upper end of the latter so that said rails are adjustably held in parallel spaced relation with portions of the longer rail protruding both above and below the corresponding ends of the shorter rail;

a second threaded bolt and wing-nut assembly interconnecting said rails at a location spaced both from said first assembly and from the lower end of said shorter rail, and

a winch mounted on the upwardly protruding portion of said longer rail,

whereby said device may be clamped to the rim of a well casing by tightening said wing-nut assemblies with said longer leg extending inside the casing and a portion of said shorter leg extending downwardly outside said casing so that said winch is suspended over the casing in position to pull a submerged pump by means of said cable.

4,296,917

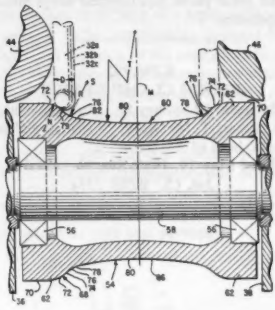
CONTOURED CABLE ROLLER

Ralph R. Day, Aurora, and B. James Wulff, Montgomery, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 3, 1980, Ser. No. 137,068
Int. Cl.³ B66D *1/36*
U.S. Cl. 254—400 **14 Claims**

1. A fairlead (**26**) for a log skidder (**10**) having a power winch (**229**, said fairlead (**26**) having a pair of vertically oriented, spaced apart side rollers (**44,46**) and a main guide roller (**54**) extending transverse to said side rollers (**44,46**), said main guide roller (**54**) having a pair of side portions (**62,62**) and a central portion (**66**) intermediate said side portions (**62,62**), a shoulder (**68**) formed on each of said side portions (**62,62**), each shoulder (**68**) having a convex section (**72**) and a concave

section (76) merging into each other and extending toward the central portion (66) of said main guide roller (54), said concave section (76) lying tangent to said central portion (66), said main guide roller (54) being of a construction sufficient for urging a



cable (32), passing through said fairlead (26) and in contact with one of said side rollers (44,46) from the adjacent shoulder (68) toward the central portion (66) of said main guide roller (54).

4,296,918

ANIMAL PEN POST

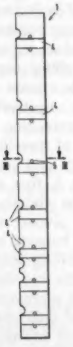
Werner Hölscher, Emsbüren, Fed. Rep. of Germany, assignor to Hölscher & Leuschner GmbH & Co., Emsbüren, Fed. Rep. of Germany

Filed May 6, 1980, Ser. No. 147,003

Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919414; May 15, 1979, 7913963[U]

Int. Cl.³ E04H *17/14*

U.S. Cl. 256—68 **2 Claims**



1. A post for an animal pen installed in a livestock shed or the like having at least two outwardly facing longitudinally extending surfaces which are adjacent to one another and which extend generally in planes disposed at right angles with respect to one another, the post being made in one piece and comprising semi-cylindrically shaped recesses in each of said longitinal surfaces for receiving horizontal rigid tubular rails, said semi-cylindrical recesses having a diameter corresponding to the diameter of said tubular rails such that said semi-cylindrical recesses accommodate and seat therein semi-cylindrical portions of said tubular rails, said recesses extending transversely of said longitudinal extending surfaces and being open at both ends, said recesses being disposed in said surfaces in pairs with one recess of each pair being in one of said longitudinal surfaces and the other of said pair being in the other longitudinal surface and with the spacing between said pairs decreasing toward the bottom of said post, said recesses being offset in height with respect to one another by at least the diameter of said recesses so that a tubular rail seated in one recess of a pair of recesses will be offset from the tubular rail seated in the other recess of said pair a distance in height at least equal to the diameter of said semi-cylindrical recesses, and for each recess at least one securing hole passing through the post for receiving a securing element for securing the tubular rail in its seated position in its respective semi-cylindrical recess in said pole, thereby providing a highly rigid animal pen.

4,296,919

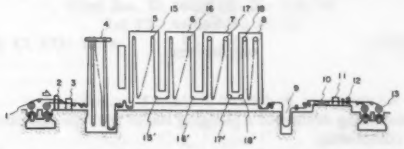
APPARATUS FOR CONTINUOUSLY PRODUCING A HIGH STRENGTH DUAL-PHASE STEEL STRIP OR SHEET

Koichi Sakurai, Kitakyusyushi; Takashi Furukawa, Machidashi; Hiroshi Takechi, Kisarazushi, and Munetsugu Matsuo, Kawasakishi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 13, 1980, Ser. No. 178,015

Int. Cl.³ C21D *9/56*

U.S. Cl. 266—111 **3 Claims**



1. An apparatus for continuously producing a high strength dual-phase steel strip or sheet having a metallurgical composition which produces a dual-phase structure composed of ferrite grains and a low temperature transformed phase when rapidly cooled from the $(\alpha+\gamma)$ temperature range or from the γ temperature range, which apparatus comprises a vertical type continuous heat treatment furnace having a heating zone, a soaking zone and a cooling zone, said cooling zone having an upper hearth roll group, a lower hearth roll group and means for cooling the strip at a rate in the range between 1° and 300° C./sec. for retaining the austenite, the hearth rolls of each hearth roll group being positioned for guiding the strip coming from the soaking zone up and down and alternatively around the upper hearth rolls and the lower hearth rolls from the inlet end to the outlet end of the cooling zone, and the hearth roll at the position where the strip is subjected to straining and begins to work harden as a result of the bending and the subsequent hearth rolls having a diameter D in millimeters according to the formula which is for the condition where the strip temperature is greater than 200° C.:

$$\frac{t}{D} + \beta \cdot T \cdot \log(CR) \cdot \frac{1}{100} \leqq \epsilon WH$$

Wherein;

t = Maximum strip thickness in millimeters;

$\epsilon WH = 0.2\%$ (Strain at which the retained austenite starts to undergo strain induced transformation into martensite and the strip begins to work harden);

β = Linear thermal expansion coefficient (12×10^{-6});

T = Temperature at which the strip is subjected to cooling, in degrees C;

CR: Cooling rate of the strip in degrees/second. whereby the strain induced phase transformation of the retained austenite and consequently the work hardening of the strip when it is passed around the hearth rolls is avoided.

4,296,920

MOLTEN METAL TREATMENT

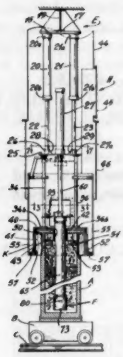
Kirk D. Miller, Rexdale; John B. Flood, Willowdale; George Dimou, Toronto; Frederick E. Kara, Islington, and Richard W. Amos, Etobicoke, all of Canada, assignors to Canron Inc., Montreal, Canada

Division of Ser. No. 806,094, Jun. 13, 1977, Pat. No. 4,199,353. This application Jan. 23, 1980, Ser. No. 114,726

Claims priority, application Canada, Jan. 18, 1977, 269973

Int. Cl.³ C21C *7/00*

U.S. Cl. 266—216 **6 Claims**



2. An apparatus, as defined in claim **1**, including,

a mounting device for a plunging rod of the type described, comprising,

an adapter having a base plate provided with a socket for receiving the end of an elevating rod extending upwards therefrom,

a boss extending downwards from said plate and having a recess for receiving a connector from the rod,

a bracket slidably seated on the base plate and having a fixed connection to the adapter,

and means for clamping the plate and bracket together to prevent their relative movement.

4,296,921

LANCE PIPE FOR REFINING AND METHOD OF MAKING THE SAME

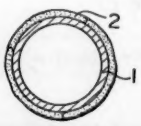
Yoshihiro Hayashi, Ohtsu, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1979, Ser. No. 63,121

Claims priority, application Japan, Aug. 28, 1978, 53-104745; Oct. 13, 1978, 53-125163

Int. Cl.³ C21B *7/16*

U.S. Cl. 266—270 **9 Claims**



1. A method of producing a heat-resistant lance pipe which comprises:

(a) providing a hollow refractory tube, and

(b) applying to at least part of the outer surface thereof a first layer of an impregnated fibrous refractory material, with said fiber being based on alumina or silica and having a diameter ranging from 0.5 to 15.0 mm, said fibers being impregnated with a mixture consisting of 40–90% by weight of a refractory aggregate having a particle size of less than −10 mesh which contains in excess of 15% by weight of particles having a particle size of −200 mesh and in excess of 15% by weight of particles having a particle size of 28–200 mesh, and from 10–50% by weight of a refractory binder which includes at least one material from the group consisting of silica sol including 5–40% by weight of solid parts, hydrolyzed ethyl silicate and fire clay suspension.

4,296,922

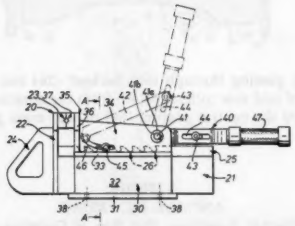
BENCH CLAMP DEVICE

Lindsay T. McGrath, 89 Sydney St., Muswellbrook, New South Wales, and Gilbert T. McGrath, 25 Mulcare Crescent, Churchill, Victoria, both of Australia

Filed May 19, 1980, Ser. No. 151,399

Int. Cl.³ B25B *1/14*

U.S. Cl. 269—211 **8 Claims**



1. A tension clamp device which comprises, in combination, a movable jaw co-extensive with an elongated adjusting arm, a hollow housing through which said adjusting arm is adapted to pass freely, said hollow housing being adapted to be mounted on a fixed base and having a main jaw integral therewith, a tension lever pivotally attached to and between two spaced, parallel side cheeks of said housing, a secondary lever pivotally fastened at one end thereof to said tension lever, the other end of said secondary lever being constrained with respect to said housing by means of a pin in sliding relationship with respect to a pair of registering travelling slots, each formed within a respective one of said side cheeks of said housing, said pin being adapted to engage selectively one of a plurality of notches formed in a rack extending longitudinally of said adjusting arm, and said pair of travelling slots being adapted to guide sliding movement of said pin therealong from a first position wherein said pin is free of engagement with said notches to a second position wherein said pin engages said one of said notches, whereby pivotal movement of said tension lever with respect to said housing initially causes said pin to slide along said pair of travelling slots from said first position to said second position whereby free sliding motion of said adjusting arm within said housing is prevented by the engagement of said pin in said notch, and then causes said housing to lock securely with respect to said adjusting arm by an over-centre action to grip firmly within said jaws any work-piece located therebetween, each of said pair of travelling slots being arcuate at the end thereof corresponding to said first position of said pin.

4,296,923

PLAYGROUND SWING

Paul W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Oct. 11, 1979, Ser. No. 84,053

Int. Cl.³ A63G *9/00*

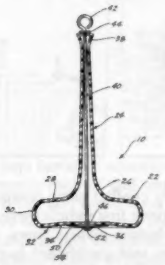
U.S. Cl. 272—85 **1 Claim**

1. A playground swing comprising:

an elevated support;

a flexible line having upper and lower ends, and being connected at its upper end to said support;

an integral hollow plastic body including a seat unit and an upstanding stem, wherein said seat unit is substantially rigid, substantially circular in cross-section, and has a cylindrical seat portion with a flat top section including rounded upper and lower edges, and an outer convex peripheral surface, and being of a depth sufficient to allow the seat portion to be comfortably gripped between the user's thighs and the back of the user's legs to stabilize the user on said body during the operation of said swing, and wherein said upstanding stem is substantially rigid, fixably connected to and substantially centrally disposed on said seat portion cylindrical along its substantial length and flaring outwardly into said seat portion at its lower end, and outwardly into an enlarged portion at its upper end, and being substantially longer than the maximum dimensions of said seat portion, whereby a hand hold is provided for a user seated on said seat portion;



a pressure plate having a centrally disposed aperture and a nut means;

and a rod having an eyelet at one end and engaging the aperture and nut means at the other end, and extending from beyond the bottom of said seat portion through and beyond the length of said stem, and wherein said eyelet is connected to the lower end of said flexible line and said other end extends through the aperture of said pressure plate into engagement with said nut means to press said plate against the outer bottom surface of said seat portion, whereby a user pulls on said stem in a pumping action to initiate the swinging motion of the swing with said stem pivoting about a horizontal axis through said eyelet, thereby moving the swing out of the plane of the flexible line and at an angle to the vertical plane.

4,296,924

TORSION EXERCISE APPARATUS

Alfred B. Anzaldua; David A. Anzaldua, and Benjamin R. Sturgeon, all of Peoria, Ill., assignors to Health Innovations, Inc., Peoria, Ill.

Filed Aug. 4, 1980, Ser. No. 175,147
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **12 Claims**

1. Exercise apparatus comprising:

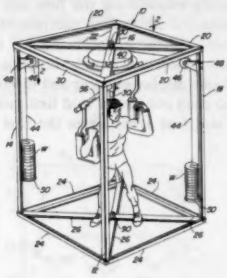
a vertically oriented framework;

wheel means carried by said framework and rotatable about a vertical axis;

adjustable resistance means connected to said wheel means and adapted to resist rotation thereof; and

a pair of horizontally spaced handle means connected to said wheel means for simultaneous rotation in the same direction, each said handle means including a handle,

said handles being spaced apart sufficiently to accommodate a user therebetween and permit the user to grip both handles simultaneously with his hands and, by rotating the handles and his torso about the wheel's vertical axis, rotate



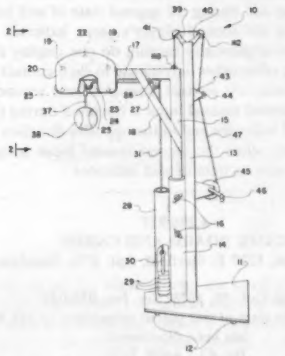
said wheel means in either a clockwise or counterclockwise direction and work against said resistance means.

4,296,925

JUMP TRAINER

William G. Alston, 151-A Treetop Dr., Fayetteville, N.C. 28301

Filed Jun. 23, 1980, Ser. No. 161,746
Int. Cl.³ A63B *5/16, 69/00*
U.S. Cl. 273—1.5 A **12 Claims**



1. A jump training device comprising: a pair of beat boards disposed back to back; means for supporting said beat boards a predetermined distance from a playing surface; and a game type ball suspended adjacent to and below said beat boards whereby an improved jump training device is provided.

4,296,926

RED LIGHT - GREEN LIGHT GAME

Gordon H. Buck, Torrance, and Martha K. Hardwick, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 26, 1979, Ser. No. 106,715
Int. Cl.³ A63F *9/14*
U.S. Cl. 273—86 R **15 Claims**

1. An electronic game comprising:

a first array of discrete, illuminatable display elements for displaying the position of a first player's piece indicium,

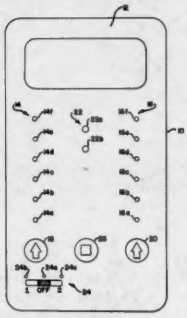
a second array of discrete, illuminatable display elements for displaying the position of a second player's piece indicium,

a stop/go indicator having first and second states,

a first manual input, comprising a first momentary contact switch, inputting to a position control means,

a second manual input, comprising a momentary contact switch, inputting to said position control means,

stop and go control means, outputting to said stop/go indicator alternately establishing the first and second states of said indicator, for controlling said position control means, said position control means being for moving the first player's piece indicium in one direction by sequentially turning on one display element and turning off another in response to each contact of said first momentary contact switch in said first array when the first manual input is



operated during the first state of said indicator and in the opposite direction in said first array when the first manual input is operated during the second state of said indicator and moving the second player's piece indicium in one direction by sequentially turning on one display element and turning off another in response to each contact of said second momentary contact switch in said second array when the second manual input is operated during the first state of said indicator and in the opposite direction in said second array when the second manual input is operated during the second state of said indicator.

4,296,927

GAME BOARD AND CARDS

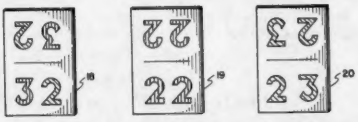
Russell E. Larsen, 1517 E. Garfield, Apt. #71, Glendale, Calif. 91205

Filed Oct. 30, 1978, Ser. No. 956,022

The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.

Int. Cl.[3] A63F *3/00*

U.S. Cl. 273—248 **8 Claims**



1. A game apparatus including:

(a) a game board with a pluarlity of separate movement zones for each player, each zone having multiple locations for movement of markers positioned therein;

(b) markers for placement in each respective zone; and

(c) a plurality of cards defining movement instructions, each card having at least two symbols representing separate but concurrent move options for a player having possession of said card, each of said symbols having corresponding identity relationship with a specific movement zone based on total numbers of columns representing directions of movement within the given movement zone to limit marker movement within said zone.

4,296,928

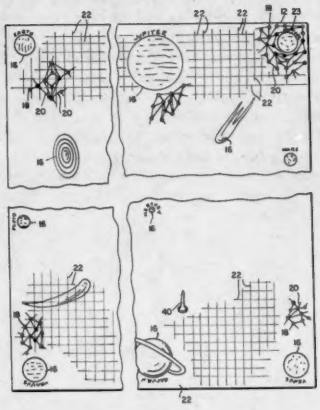
INTERPLANETARY CONFLICT GAME

Howard H. Nick, Darren Rd., La Grangeville, N.Y. 12540

Filed Dec. 5, 1979, Ser. No. 100,463

Int. Cl.[3] A63F *3/00, 3/04*

U.S. Cl. 273—262 **7 Claims**



1. An interplanetary conflict game comprising:

(a) a gameboard having first indicia thereon symbolic of the solar system including planets, stars, and travel routes between the stars, said gameboard further including second indicia to determine the distance between said stars,

(b) a plurality of rocket markers for each player to be manually moved by a player between said stars and planets and to fire at an opponent player's rocket or to capture an opponent's planet,

(c) a group of colored rating spheres, each having an external curved surface, a conical-shaped passageway extending along a center line through a rating sphere, and a slot extending the length of the center line for easy removal of the rating sphere from a rocket marker to which it is attached in order to indicate the numerical rating of the rocket markers,

(d) a firing chart for determining a firing range between a player's rocket and an opponent's rocket,

(e) a promotion chart for determining the proper rating sphere for said rocket markers,

(f) a legend chart for indicating the number of moves for a rocket marker as indicated by its rating sphere,

(g) a group of firing cards to be drawn by a player desiring to fire his rocket at a rocket belonging to an opponent player instructing the player as to whether the rocket hits or misses.

4,296,929

ELECTRIC EYE ACTUATED GUN ARCADE

Burton C. Meyer, Downers Grove; Gunars Licitis, Lombard, and Derek A. Brand, Naperville, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 19, 1976, Ser. No. 659,216

Int. Cl.[3] F41J *5/02*

U.S. Cl. 273—310 **11 Claims**

1. A target shooting apparatus, comprising:

a plurality of target devices;

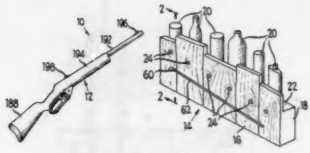
a frame for removably supporting said plurality of target devices;

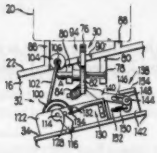
a plurality of actuatable target impellers mounted on the frame and each associated with one of said targets to knock the respective target off of said frame when the respective target impeller is actuated;

circuit means including a photodetector remotely disposed

from the targets providing an output signal upon the sensing of a properly aimed light beam;

control means including a power supply and drive means associated with said circuit means and one of said target impellers for actuation thereof in response to receipt of the output signal from said circuit means, said circuit means and control means being movably mounted on a carriage for movement from a first target impeller seriatim to a





second target impeller after actuation of said first target impeller whereupon each of said targets may be sequentially knocked off of said frame upon sequential actuation of the respective target impellers; and

a selectively operable aiming device including a light source therein for directing a beam of light therefrom, said light source being arranged so as to direct the light beam toward the photodetector when the aiming device is properly aimed toward the respective target.

4,296,930

TV GAME APPARATUS

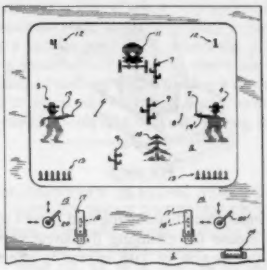
Jeffrey E. Frederiksen, Milwaukee, Wis., assignor to Bally Manufacturing Corporation, Chicago, Ill.

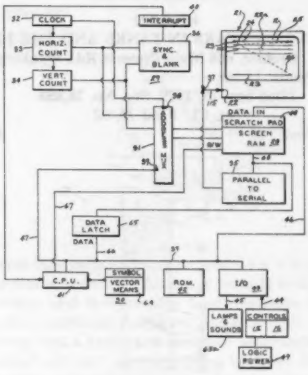
Continuation of Ser. No. 635,406, Nov. 26, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,662

Int. Cl.³ A63F 9/22

U.S. Cl. 273—313 **26 Claims**

2. A player-operated game apparatus for use with a display screen means having an intensity control means for varying the intensities of picture elements for the presentation of movable symbols on a screen, said apparatus comprising player-operated means including input elements adapted to be operated by a player and signal means actuable by said input elements for affecting the display of symbols and initiation interaction of the player with the symbols on the screen; random access memory for storing in a digital form a set of digital bits representing the intensities necessary for generating a display on said screen and locating the symbols within the display; display controller means for addressing said random access memory and reading the set of bits in the random access memory in time-spaced read periods separated by reading idle periods, in each of which read periods one or more bits associated with a desired display are read from the random access memory, said display controller means being adapted for connection to said intensity control means of the display means to transmit the bits to said intensity control means to present the desired display stored in said random access memory; a microprocessor; program means; communicating port means for connecting the signal means of the player-operated means to the microprocessor, said microprocessor having means for accessing said program means and means for reading from and writing to said random access memory to represent symbols in response to said signal means and said program means whereby the microprocessor revises and controls interaction of the symbols within the display; control means operatively coupling the random access memory to the microprocessor during said reading idle periods to change said random access memory between said read periods; and processing means operatively coupled to the microprocessor for receiving therefrom control signals and symbol signals representative of a symbol to be displayed on the display, the control signals activating the





processing means for transforming the symbol signals to produce transformed symbol signals so that a symbol represented by the transformed symbol signals is different than a symbol represented by the symbol signals relative to the display, and for providing smooth appearing continuous movement of the symbols on the display.

4,296,931

PROJECTING-TYPE SHOOTING GAME APPARATUS

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Mar. 26, 1979, Ser. No. 23,780

Claims priority, application Japan, Apr. 20, 1978, 53-047325; Apr. 20, 1978, 53-047326; Apr. 29, 1978, 53-051869; Apr. 29, 1978, 53-059077[U]

Int. Cl.³ A63F 9/02

U.S. Cl. 273—316 **5 Claims**

1. A projector-type shooting game apparatus comprising:

a screen;

a housing having a longitudinal axis and for projecting a target image onto said screen;

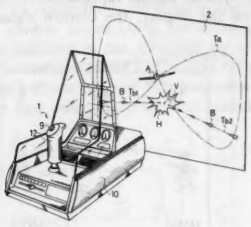
a mirror rotatably coupled to said housing such that said mirror is rotatable in first and second axes mutually perpendicular to each other and both of said first and second axes being perpendicular to said longitudinal axis;

a means for changing an angle of said mirror about said first axis;

a means for changing an angle of said mirror about said second axis;

a driving means for driving both said angle changing means;

a lever manually movable about third and fourth axes;



a means for mechanically coupling said lever's movement to both said means for changing the angle of said mirror, whereby the motion of said mirror is effected by said driving means and by a player's manual operation of said lever.

4,296,932

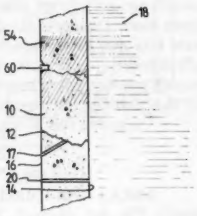
SEALING OF LEAKS IN TANKS AND THE LIKE

Johannes H. Grobler, 668 Main Pretoria Rd., Wynberg, Johannesburg, South Africa

Filed Sep. 13, 1979, Ser. No. 74,858

Int. Cl.[3] F16J *15/02*

U.S. Cl. 277—1 **4 Claims**



1. The method of sealing a fluid passage in a body comprising forming in the body a second passage which intersects the fluid passage and introducing through the second passage to the fluid passage a composition comprising a rubber latex and a bituminous material in sufficient quantity to form an aggregate which effectively seals the fluid passage in the presence of a coagulating agent.

4,296,933

PIPE JOINT SEAL

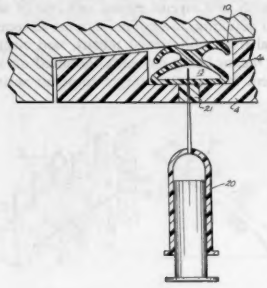
Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Division of Ser. No. 40,273, May 17, 1979, Pat. No. 4,209,179. This application Jan. 18, 1980, Ser. No. 113,358

Int. Cl.[3] F16J *15/32, 15/46*

U.S. Cl. 277—34.3 **3 Claims**

1. A pipe joint seal and coupler collar for sealing and connecting pipe sections comprising: an annular channel in said coupler collar; said seal being annular and being positioned in said channel; said seal including a hollow, annular inflatable bladder; said coupler collar including an inflation access means extending from an external surface of said coupler collar to said channel whereby inflating means can be inserted through said inflation access means and into said bladder for inflating said seal when it is in its operative sealing position and wherein said seal further includes an annular base member and at least one annular and outwardly curved sealing flange curving upwardly, outwardly and then downwardly from said base member for tightening against the pipe joint surface which it



abuts when fluid pressure is exerted against the seal; said bladder being located in said base member.

4,296,934

SEALING ASSEMBLY

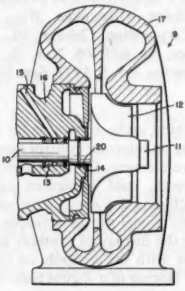
Howard S. Atkin, Leeds, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Filed Jun. 7, 1979, Ser. No. 46,409

Claims priority, application United Kingdom, Jun. 9, 1978, 26635/78

Int. Cl.[3] F16J *15/34, 15/46*

U.S. Cl. 277—81 R **3 Claims**



1. A turbine assembly comprising:

a turbine housing having an internal cylindrical surface;

a turbine wheel shaft rotatable relative to said housing and having an external cylindrical surface opposing the internal cylindrical surface, said turbine wheel shaft having an annular groove formed therein;

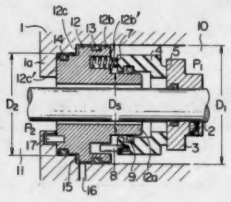
a sealing ring positioned in said annular groove and having a cylindrical radially outer surface engaging the cylindrical surface of said turbine housing;

one of the axial faces of said sealing ring having a chamfered portion so that the axial dimension of the radially inner surface of the sealing ring is less than the axial dimension of the cylindrical radially outer surface of the sealing ring, the annular groove including a complementary shaped cone-like wedging surface for cooperating engagement with the chamfered surface of the sealing ring.

4,296,935
MECHANICAL SEAL

Hiroshi Inouye, Minorimachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 10, 1979, Ser. No. 83,340
Claims priority, application Japan, Oct. 9, 1978, 53-123620
Int. Cl.³ F16J *15/34, 15/48*
U.S. Cl. 277—91 R 2 Claims



1. A mechanical seal for sealing the rotary shaft of a rotary machine wherein the pressure difference between the internal and external liquid acting on said mechanical seal changes from positive to negative or from negative to positive, characterized in that

an axially movable but nonrotatable ring and a seat ring are formed with seal faces which coact to seal between the internal liquid present externally of a retainer and the external liquid present internally of said retainer,

said seat ring is liquid-tightly and securely mounted on said rotary shaft,

said retainer is disposed for axial movement, but is prevented from rotating about the axis of said rotary shaft by a bias spring and a stop means,

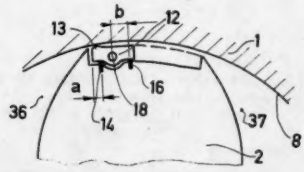
said bias spring normally biases said retainer against said seat ring and provides the sealing force for pressing the seal face of said retainer against the seal face of said seat ring when the external liquid pressure becomes higher than the internal liquid pressure, but the difference therebetween is small and less than a predetermined level, said retainer is disposed within a casing and is forced to move axially depending upon the difference in pressure between the internal and external liquids, and

O-rings are interposed between the casing and the retainer and between the retainer and the axially movable, but nonrotatable ring.

4,296,936
SEAL MECHANISM FOR THE ROTOR PERIPHERY OF A ROTARY PISTON ENGINE

Felix Wankel, Bregenzer Strasse 82, D-899 Lindau, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,784
Claims priority, application Switzerland, Mar. 27, 1979, 2841/79
Int. Cl.³ F16J *15/48;* F01C *19/02*
U.S. Cl. 277—81 P 18 Claims

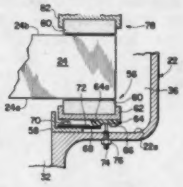


1. A seal mechanism for the periphery of the rotor of a rotary piston engine operating with a fluid working medium comprising: a sealing ledge extending generally parallel to the axis of said rotor and supported on said rotor so as to be pivotable about an axis extending in the longitudinal direction thereof, said sealing ledge being arranged for sealing contact along a limited region of its periphery with an opposed sealing surface in said engine; and secondary seal means provided at at least one point on the periphery of said sealing ledge extending parallel thereto and acting between said sealing ledge and said rotor, said secondary seal means operating to establish on said sealing edge a surface area upon which the pressure of said fluid working medium acts such that there are developed on said sealing ledge resulting forces having a desired magnitude and directed to place said limited region of said sealing ledge into sealing contact with said opposed sealing surface.

4,296,937
RUBBING-CONTACT SEALING STRUCTURE FOR ROTARY HEAT REGENERATOR

Noritoshi Handa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 13, 1979, Ser. No. 57,291
Claims priority, application Japan, Jul. 20, 1978, 53-100631[U]
Int. Cl.³ F28D *19/04*
U.S. Cl. 277—88 15 Claims



1. A rubbing-contact sealing structure for a heat regenerative core rotatable within a stationary housing structure having high-pressure and low-pressure fluid chambers arranged in counter-flow relationship adjacent one face of the heat regenerative core and a high-pressure space surrounding the heat regenerative core and communicating with the high-pressure fluid chamber, comprising: a main seal element having an inner end face to be in rubbing contact with said face of the heat regenerative core, and an elastic pressing member in the form of a substantially flat single plate provided in sealing engagement between said main seal element and said housing structure and at least in part elastically deformable toward and away from said face of the heat regenerative core, the pressing member having an outer face at least in part exposed to said fluid space and laterally extending substantially in parallel with said face of the heat regenerative core in the absence of a differential fluid pressure between the two sides of the pressing member, one end of said pressing member being secured to the housing structure while the other end thereof elastically presses said main seal element against the regenerative core with the aid of the pressure difference between the two sides of said pressing member.

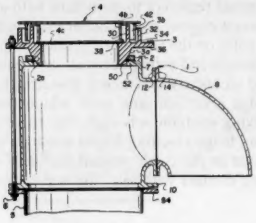
4,296,938
IMMERSION-TYPE SEAL FOR THE STANDPIPE OPENING OF COKE OVENS

Ludwig Offermann, Olfen, and Rheinhold Wippich, Recklinghausen, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & KG, Recklinghausen, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 145,976
Claims priority, application Fed. Rep. of Germany, May 17, 1979, 7914320[U]
Int. Cl.³ C10B *25/20;* F16J *15/40*
U.S. Cl. 277—135 6 Claims

1. An immersion-type seal for a standpipe opening of coke

ovens, comprising a standpipe having a top opening with an annular encircling rim, an annular seal frame having a bottom peripheral spherical edge overyling said rim and sealing the



opening, said seal frame having wall portions defining an open topped water sealing trough, and a standpipe lid having an annular skirt portion engaged in said water trough and a top closing the top of said seal frame.

4,296,939

SPEED UP DEVICE FOR BICYCLE

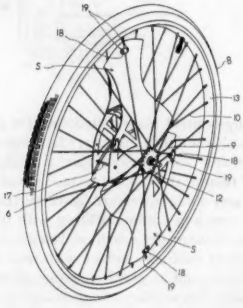
Masaru Iwamoto, 98 Otsukawa-Hiedacho, Handa City, Aichi Prefecture, Japan

Filed Feb. 9, 1979, Ser. No. 10,838

Claims priority, application Japan, Jun. 2, 1978, 53-75718[U]

Int. Cl.³ B62M *1/10*

U.S. Cl. 280—212 **1 Claim**



1. In the known combination of a bicycle wheel that includes a rim, an axle and two sets of spokes extending from opposite ends of said axle outwardly toward said rim, the improvement which comprises:

(a) at least two devices located within said rim, around said axle and between said two sets of spokes,

(b) each said device including a pair of axe-shaped sheet members positioned in opposed relationship with each other with

portions of said sheet members being joined together at their edge portions, and

other portions of said sheet members being spaced apart with respect to each other,

(c) the bottom edge of each sheet member being disposed adjacent the axle of the wheel,

(d) the top edge of each sheet member being disposed adjacent the rim of the wheel,

(e) each sheet member having spaced apart side edges that extend between said top and bottom edges,

(f) the top edges of each pair of opposed sheet members being joined together so as to essentially form an elongated outer edge,

(g) one of the two pairs of opposed side edges of each pair of opposed sheet members being joined together so as to form a leading side edge,

(h) guide grooves located along the bottom edge of each sheet member,

(i) a spacing member mounted in said guide grooves intermediate each pair of opposed sheet members, which spacing member is shaped so that when it is inserted in said guide grooves it

causes one of said two pair of side edges of opposed sheet members to be spread apart with respect to each other, and

causes the other of said two pair of side edges of opposed sheet members to converge with respect to each other, and

(j) mounting means for securely mounting each said device in a position between said two sets of spokes,

(k) each said device being widest near the axles, somewhat less wide near the rim and narrowest at a point intermediate the rim and said axle.

4,296,940

FOLDING BICYCLE

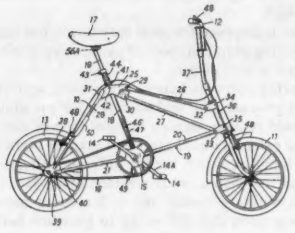
Hugh G. Herbert, 1*B* Limpsfield Ave., London SW19 6DL, England

Filed May 14, 1979, Ser. No. 38,732

Claims priority, application United Kingdom, May 22, 1978, 21056/78

Int. Cl.³ B62K *15/00*

U.S. Cl. 280—278 **12 Claims**



1. In a folding bicycle comprising a frame, a front wheel and handlebars at the front end of the frame, a rear wheel at the rear end of the frame, and a saddle carried at an intermediate part of the frame, the improvement wherein said frame comprises a base including generally-aligned end-to-end tie members having adjacent ends and remote ends, a bearing unit to which said tie members are pivotally connected at their adjacent ends, an apex joint having a bearing opening, strut members connected between said apex joint and the remote ends of the tie members, and a support member, which extends from said bearing unit to which it is secured and slidably through said bearing opening in the apex joint to carry said saddle, said frame being collapsible on raising said support member to move said bearing unit towards said apex joint and so swing the front and rear wheels downwardly into positions alongside one another.

4,296,941

FOLDING GOOSENECK ASSEMBLY

Bernard Van Wassenhove, Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Aug. 6, 1979, Ser. No. 63,955

Int. Cl.³ B60P *1/04*

U.S. Cl. 280—423 B **18 Claims**

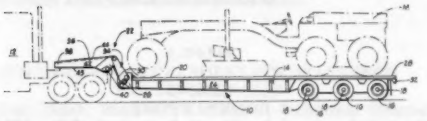
1. An improved linkage assembly for use with a folding gooseneck trailer having a forward gooseneck member and a load carrying means, said forward gooseneck member having a forward end portion and a rearward end portion, the rear-

ward end portion including an upper portion and a lower portion, said load carrying means having a forwardly extending end portion and a rearward end portion, said linkage assembly operably connecting the forward end portion of the load carrying means to the rearward end portion of the forward gooseneck member, said improved linkage assembly comprising:

a. first linkage means for connecting the forward gooseneck member to said load carrying means, said first linkage means having a forward end portion and an opposed rearward end portion, the forward end portion of the first linkage means pivotally secured to the upper portion of the rearward end portion of said forward gooseneck member;

b. camming means operatively connecting the opposed rearward end portion of said first linkage means to the forwardly extending end portion of said load carrying means, said camming means being pivotally connected to the opposed rearward end portion of said first linkage means and connected to said forwardly extending end portion of said load carrying means for permitting sliding movement of said first linkage means along a longitudinal axis which is substantially parallel to the longitudinal axis of said load carrying means, said camming means comprising:

1. a housing having an elongated opening therein;
2. a cam positionable within the elongated opening of said housing for movement along the longitudinal axis of said housing; and
3. a pin having said cam operatively connected thereto so that one end portion of said pin extends outwardly from said housing and said cam, the outwardly extending end portion of said pin pivotally secured to the rearward end portion of said first linkage means;



c. second linkage means for connecting the forward gooseneck member to said load carrying means, said second linkage means having a forward end portion and an opposed rearward end portion, the forward end portion of said second linkage means pivotally secured to the lower portion of the rearward end portion of said forward gooseneck member at a position below the pivotal attachment of said forward end portion of said first linkage means, the opposed rearward end portion of the second linkage means pivotally secured to the forwardly extending end portion of said load carrying means at a position below and forward the slidable attachment of said rearward end portion of said first linkage means to said load carrying means; and

d. linkage assembly stabilizing means operatively connected to the rearward end portion of said first linkage means and the forward portion of said load carrying means for securing said first linkage means in a first position when the forward gooseneck member and the linkage assembly are in a first folded position and said linkage assembly stabilizing means is in a first position, said linkage assembly stabilizing means securing said first linkage means in a second position when the forward gooseneck member and the linkage assembly are in a second folded position and said linkage assembly stabilizing means is in a second position, said first and second linkage means cooperating to form a linkage assembly substantially having a parallelogram configuration when the forward gooseneck member and linkage assembly are in one of the first and second folded positions, and said first and second linkage means cooperating to form a linkage assembly having a non-parallelogram configuration when the forward gooseneck member and linkage assembly are in an unfolded position.

4,296,942

EMERGENCY RELEASE SYSTEMS

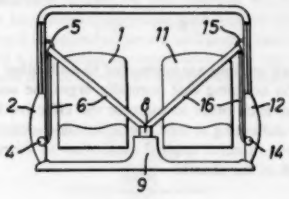
Roy Clifford, Ampthill, England, assignor to Kangol Magnet Limited, Carlisle, England

Continuation of Ser. No. 893,418, Apr. 4, 1978. This application Sep. 26, 1979, Ser. No. 79,235

Claims priority, application United Kingdom, Apr. 18, 1975, 16198/75

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—803 **5 Claims**



1. A vehicle comprising:

two separate vehicle seats located in said vehicle in adjacency,

two passive seat belt systems each associated with a respective one of said vehicle seats, each system being adapted to occupy either a position of use or an out of use position in dependence on a vehicle condition and comprising a seat belt means extending in the position of use across the associated seat,

connector means adapted to releasably connect both said seat belt means together to said vehicle at a position between said seats, said connector means being manually operable by a single operation to effect disconnection of said seat belt means from said vehicle to render both said seat belt systems incapable of restraining the occupants of the seats therein, each of said seat belt systems comprising a retractor having a retractor spring, said seat belt means being withdrawable from said retractor against the pull of said spring, said seats being located between two vehicle doors and the retractor of each of said seat belt systems being mounted on the one of said doors adjacent the associated seat, and a guide means for said seat belt means carried by each of said doors at a position above the associated retractor at about the level of the faces of the occupants of the seats, each of said belts extending upwardly from said retractor to said guide means and diagonally downwards from said guide means to said connector means, whereby said seat belt means extend across and above said seats in front of the faces of the occupants on release of the seat belt means from said connection means.

4,296,943

DEVICE FOR HOLDING A PASSIVE VEHICLE RESTRAINT BELT AT A RESTRAINING POSITION

Juichiro Takada, 3-12-1 Shinmachi Setagayaku, Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,541

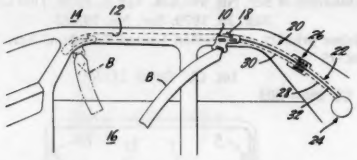
Claims priority, application Japan, Mar. 2, 1979, 54-023431

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **6 Claims**

1. In a passive vehicle restraint belt system which includes a moving anchor that is coupled by a sheathed drive wire to a drive device for moving the anchor along a predetermined path in the vehicle between an occupant-restraining location and an occupant-releasing location, the sheath of the drive wire extending from adjacent the drive device to adjacent a stop means at the occupant-restraining location of the moving

anchor, the improvement wherein the sheath of the drive wire is composed of two sections, one of which is affixed to a portion of the vehicle at a location adjacent the occupant-restraining location of the moving anchor, the other of which is affixed to a portion of the vehicle at a location adjacent the drive device and at least one of which is non-rigid and deflectable,



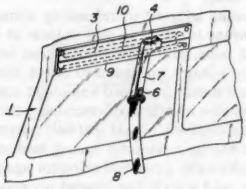
and the two sections are connected to each other by a resilient lost-motion coupling that normally urges the sections axially away from each other to increase the effective length of the sheath by deflecting at least the deflectable section thereof but allows them to move toward each other to shorten the effective length of the sheath.

4,296,944

COVERING CONSTRUCTION OF A GUIDE RAIL

Hideoki Matsuoka, Yokohama, and Yoshinobu Kondo, Kosai, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Fuji Kiko Co., Ltd.,, Tokyo, both of, Japan

Filed Feb. 4, 1980, Ser. No. 118,432
Claims priority, application Japan, Feb. 5, 1979, 54-13974[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **3 Claims**



1. A covering construction of a guide rail of a safety seat belt device of a vehicle having a guide rail with an opening and mounted on an inner wall of the vehicle and a sliding member arranged to slide freely in the guide rail and extending beyond the opening and connected to a seat belt, the improvement lies in that a flexible cover sheet, having a slit extending in the middle thereof and along the opening of the guide rail, is arranged to normally close said opening of the guide rail and allowing passage of the sliding member in the slit.

4,296,945

POCKET SECRETARY OR THE LIKE

Kathleen W. Pavlik, R.D. #1, Box 328A, Rehoboth, Del. 19971

Continuation of Ser. No. 874,609, Feb. 2, 1978, abandoned. This application Dec. 5, 1979, Ser. No. 100,596
Int. Cl.³ B42D *3/00*; A45C *1/08*
U.S. Cl. 281—1 **8 Claims**

1. A pocket secretary or the like, comprising:

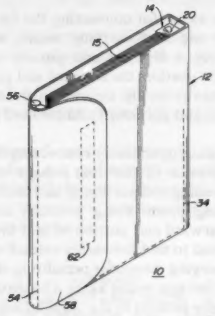
a flexible foldable member with at least two folding areas;

three pocket means secured to said foldable member, one of said pocket means being narrow, for holding writing implements, and being disposed in a folding area of said foldable member;

means for detachably mounting a separately bound notebook, secured to another folding area of said foldable member;

an envelope means secured to said foldable member together with said detachable mounting means; and

releasable closure means for retaining said foldable member in a folded condition, including an overlapping flap and releasable attachment means, wherein said narrow pocket



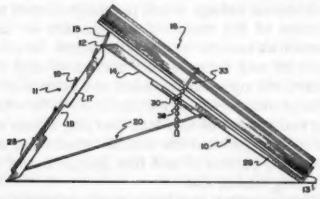
means is disposed opposite said detachable mounting means when said member is folded, and said other two pocket means are disposed opposite one another, said mounting means and said writing implements, when held in said narrow pocket means, providing structural support for said flexible member, when folded.

4,296,946

BOOK SUPPORT

Frank J. Larre, and Jeannine G. Larre, both of Box 452, St. Walburg, Saskatchewan, Canada

Filed Aug. 27, 1979, Ser. No. 69,719
Int. Cl.³ B42D *9/00*
U.S. Cl. 281—45 **10 Claims**



1. A book holder and support comprising in combination a front book supporting panel and a rear panel hingedly secured by the upper edge thereof to the upper edge of said front panel to form, when open, an inverted V-shape when viewed in side elevation, means cooperating between said panels to adjust the angularity between same and within limits, and means to detachably retain a book in the open position upon said front panel, said means to adjust the angularity between said front and rear panels including a flexible cord anchored by each end thereof adjacent each side of said front panel, guide means adjacent the side edges of said rear panel, said cord passing freely through said guide means, and a plurality of vertically situated cord anchoring means extending outwardly from the rear surface of said rear panel, the looped center portion of said cord detachably engaging one of said anchoring means in non-sliding relationship.

4,296,947

PRESSURE-SENSITIVE TRANSFER SHEETS USING NOVEL RADIATION CURABLE COATINGS

Sydney M. Spatz, Circleville; Robert C. Hydell, and Gerald T. Davis, both of Chillicothe, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 697,019, Jun. 17, 1976, Pat. No. 4,138,508. This application Feb. 2, 1979, Ser. No. 9,382

The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.

Int. Cl.³ B41M *5/22*

U.S. Cl. 282—27.5 **2 Claims**

1. A pressure-sensitive, carbonless transfer sheet comprising a paper substrate, said paper substrate having coated thereon a barrier layer and a cured resinous film coated on said barrier layer, said cured resinous film comprising:

(a) a carrier oil;

(b) at least one color precursor selected from the group consisting of lactone phthalides, lactone fluorans and mixtures thereof, said color precursor being dissolved in said carrier oil to form a color precursor solution; and

(c) a radiation curable substance, said radiation curable substance being selected from the group consisting of: isocyanate modified acrylic, methacrylic and itaconic acid esters of polyhydric alcohols, acrylic prepolymers derived from partial esterfication of pentaerythritol with acrylic acid and acrylic acid esters and mixtures thereof;

said resinous film being cured by radiation to a frangibility that will permit passage of said color precursor and said carrier oil to the surface of said cured resinous film when said cured resinous film is broken, said color precursor solution being retained as small occlusions within a matrix of closely packed cross-linked molecular chains of cured resin.

4,296,948

COLOR-DEVELOPING SHEET FOR NO-CARBON COPYING PROCESS

Tsutomu Satoh; Hideo Ohye; Hirokazu Tsukahara; Hideaki Senoh, and Takahiro Torii, all of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,176

Int. Cl.³ B41M *5/16, 5/22*

U.S. Cl. 282—27.5 **7 Claims**

1. A color-developing pressure sensitive sheet for use in no-carbon copying system, comprising a support and an electron-accepting color-developing layer thereon of a combination of a phenol-formaldehyde resin with a solid acid which is an active silicic acid, which are capable of developing color upon reacting with an electron-donating colorless dye, characterized in that titanium dioxide is incorporated into the said electron-accepting color-developing layer in an amount of from about 2 to about 4 parts by weight based on one part by weight of the phenol-formaldehyde resin.

4,296,949

ROTATABLE CONNECTING DEVICE FOR I.V. ADMINISTRATION SET

Andrew J. Muetterties, Gages Lake; John L. Vcelka, Zion, and Wayne R. Kelsey, Des Plaines, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 6, 1979, Ser. No. 64,141

Int. Cl.³ F16L *19/02*

U.S. Cl. 285—18 **20 Claims**

1. A connecting device for an intravenous administration set comprising:

a first member defining a fluid passage means and having a longitudinal axis;

a second member defining a fluid passage means and having a longitudinal axis;

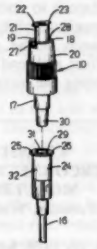
tapering interfitment means constructed and arranged with respect to each said member for fluid-tight engagement;

a length of tubing secured to at least one member opposite said tapering interfitment means;

a flange extending from one of said first or second members adjacent said tapering interfitment means;

a collar member alternately and rotatably mounted on one of said first or second members opposite said flange, said collar member having internal threads for engagement with said flange; and

captive means operatively associated with one of said members and said collar member to permit free movement along the longitudinal axis of said member while retaining said collar on said member yet permitting rotatable engagement with said flange, said captive means including a tapering surface defined by said member mounting said collar for interference therewith, said captive means constructed and arranged to permit said collar member to be positioned a substantial distance away from said tapering interfitment means carried by said member mounting said



collar member for complete exposure for sterilization purposes, said captive means further including cooperating means defined by said member mounting said collar member and said collar member to provide an interlocking mechanism, said cooperating means positioned on said collar member opposite said internal threads and on said mounting member opposite said tapering surface;

so that when said tapering interfitment means is interengaged, said collar member will engage said flange and upon rotation of said collar the interfitment means will be forced into fluid-tight engagement and said collar member will engage said tapering surface without rotation of said first or second members, and upon a reverse rotation of said collar member and movement of said collar member away from said flange, said interlocking mechanism will interengage whereby rotation of said collar will cause rotation of said member mounting said collar without rotation of said member with said flange.

4,296,950

CORROSION RESISTANT PIPE JOINT

Richard L. Chamberlin, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 18, 1979, Ser. No. 58,697

Int. Cl.³ F16L *19/06*

U.S. Cl. 285—45 **8 Claims**

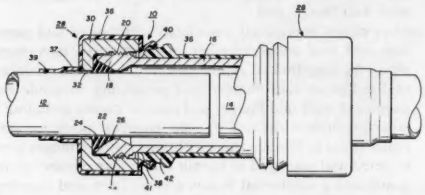
1. In pipe joint forming members including a first metal component having a male thread and a second metal component having a female thread, corrosion protection for the joint adapted to be provided by said components and comprising in combination:

(a) a first polymeric plastic coating formed about the periphery of said male threaded component and terminating behind the thread thereof;

(b) a second polymeric plastic coating formed about the periphery of said female threaded component and terminating in an annular flexible skirt extending beyond the joint forming end thereof, said skirt being adapted when said male and female components are threadedly assem-

bled in joint formation to surroundingly overlap a portion of the coating on said male component; and

(c) at least one polymeric plastic annular lip of locally beaded cross-section integrally formed extending radially inward on an opposing surface of at least one of said overlapped skirt or coating thereat;



(d) said lip being adapted to cooperate with said opposing surface at any longitudinal location along the mutual overlap therebetween in the course of assembling said components to effect a threadlessly compressive sealing engagement enclosing the metal threads of the joint formation.

4,296,951

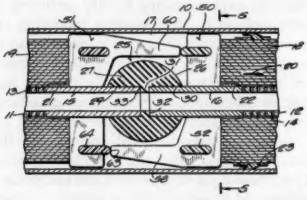
SPHEROIDAL INTERCONNECTOR FOR FILTRATION MODULES

Robert D. Zimmerly, Kenosha, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Jun. 29, 1979, Ser. No. 53,636

Int. Cl.³ F16L *17/00*

U.S. Cl. 285—95 **7 Claims**



1. A coupling assembly comprising two coaxial conduit members, an interconnector means for coupling and sealing said coaxial members, and wall means defining a pressure chamber around said members adapted to contain a pressurized fluid between said members and said wall means, said interconnector means having a spheroidal body located within said pressure chamber and comprised of elastomeric material, said body having coaxial bores extending into it from opposite sides for receiving the respective ends of said members in a snug fitting relationship, and said body being operative to transmit pressure exerted by the fluid on its outside surface to the surface constituting the interface area between said bores and the members in the bores, the area of said outside surface of the body being substantially larger than said interface area so that the force on a unit area of said interfacing surface is greater than the force exerted by said fluid on a unit area of said outside surface to enhance the seal between said members.

4,296,952

ROTARY JOINT

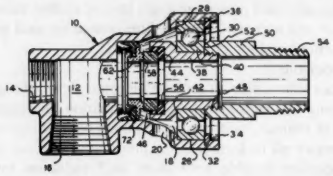
Donald G. McCracken, Horton, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 30, 1979, Ser. No. 61,598

Int. Cl.³ F16L *00/00*

U.S. Cl. 285—98 **5 Claims**

1. A rotary joint comprising, in combination, an annular housing having a first port in communication with a chamber defined therein, a single annular anti-friction bearing mounted upon said housing within said chamber, a tubular sleeve mounted within said bearing for rotation within said chamber about an axis, a second port defined by said sleeve communicating with said chamber, an annular elastic cushion mounted on said sleeve adjacent said second port, an annular rigid seal element supported upon said cushion defining an annular radially disposed sealing surface defined on said sleeve concentric with said axis, an annular seal within said chamber concentric with said axis sealingly and slidably engaging said sealing surface, annular resilient seal support means sealed with re-



spect to said housing flexibly supporting said annular seal and constituting the sole support of said seal whereby said seal is self-aligning with respect to said sealing surface, a cylindrical surface defined in said chamber coaxial to said axis, said seal support means comprising an elastomeric ring having a first lip seal portion sealingly engaging said cylindrical surface, a cylindrical surface defined on said annular seal coaxial to said axis, said ring having a second lip seal portion engaging said seal cylindrical surface wherein said seal is supported within said ring, fluid pressure within said housing biasing said seal into engagement with said sealing surface and said lip seals into sealing relation to their associated cylindrical surface.

4,296,953

SLIPPING-OFF PREVENTING PIPE JOINT

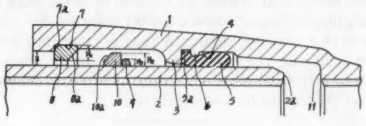
Shozo Nagao; Yoshinobu Ohashi; Yuichi Watanabe, and Yoshikazu Wakushima, all of Amagasaki, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 13, 1979, Ser. No. 93,613

Claims priority, application Japan, Dec. 22, 1978, 53-162499; Dec. 22, 1978, 53-179613[U]; Dec. 22, 1978, 53-179614[U]; Dec. 22, 1978, 53-179615[U]

Int. Cl.³ F16L *27/12*

U.S. Cl. 285—302 **6 Claims**



1. In a pipe joint comprising a socket having a seal accomodating portion in its inner periphery, a spigot insertable into the socket, and an annular seal retained in the accomodating portion and compressively engageable by the outer periphery of the spigot against the accomodating portion for sealing the clearance between the socket and the spigot when the spigot is inserted into the socket, the improvement wherein:

an engaging member comprising a second split lock ring is detachably attached to the inner periphery of the socket and is positioned away from the seal accomodating portion toward the opening of the socket, the second split lock ring being capable of exerting a diametrically expansive force and being engageable from inside the socket axially thereof with a radially inwardly extending face forming a stepped portion on the inner periphery of the socket between the second split lock ring and the socket

opening, the second split lock ring providing an engaging portion projecting radially inward from the inner periphery of the socket;

a protrusion is formed on the outer periphery of the spigot and is positioned between the seal accomodating portion and the engaging member on the socket;

a first split lock ring capable of exerting a diametrically contractive force is fitted to the outer periphery of the spigot between the protrusion on the spigot and the engaging member on the socket, the first lock ring being normally spaced from and engageable with the engaging portion of said engaging member and with said protrusion in response to relative axial separating movement between the socket and spigot; and

each of said first and second lock rings has a radial thickness less than the radial clearance between the inner surface of the socket opening and the outer surface of the spigot whereby said lock rings are insertable through said clearance to their respective assembled positions after the spigot has been inserted into the socket and into compressive engagement with said annular seal.

4,296,954

PIPE COUPLING AND PIPE JOINT CONNECTION

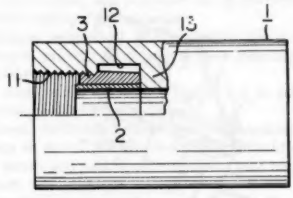
Kiyoshi Fujimaki, Kusatsu; Yoshiaki Bando, Shiga; Takesi Okuyama, Kyoto, and Tutomu Hashimoto, Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1979, Ser. No. 74,806

Claims priority, application Japan, Sep. 14, 1978, 53-126827[U]; Dec. 4, 1978, 53-167386[U]

Int. Cl.³ F16L *17/06*

U.S. Cl. 285—331 **4 Claims**



1. A pipe coupling comprising:

a main annular body having a central axis and an internally threaded portion at the open end thereof for threaded engagement with an inside-coated pipe having an exterior mating threaded end portion, an internal annular groove at the inner end of said internally threaded portion, and an annular projection at the inner side of said annular groove and projecting toward said axis of said annular body;

a short cylindrical body mounted within said main body having an outer cylindrical surface and having one end abutting said annular projection; and

an annular packing mounted within the space defined by said internally threaded portion, said annular groove and the outer cylindrical surface of said cylindrical body, the dimension of the circumferential surface of the annular packing parallel to said axis of said annular body and when said packing is in the uncompressed state being greater than the corresponding dimension of the circumferential surface of the annular groove and less than the corresponding dimension of the cylindrical outer surface of said short cylindrical body, and the end of the annular packing toward the open end of the main body being pressed into the internally threaded portion for being provisionally fixed in position in said pipe coupling.

4,296,955

COMPOSITE COUPLING DEVICE WITH HIGH RECOVERY DRIVER

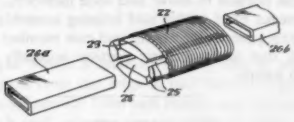
Charles L. Martin, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 404,724, Oct. 9, 1973, abandoned, and a continuation-in-part of Ser. No. 404,723, Oct. 9, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,207

Claims priority, application Sweden, Apr. 9, 1975, 6975040

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—381 **46 Claims**



1. A composite device which comprises:

(a) a hollow, heat-recoverable, helical spring member made from helically wound sheet or wire of memory metal, said heat-recoverable member having a cross-section such that sections perpendicular to the axis of the heat-recoverable member each show a discontinuity; and

(b) a hollow sleeve, open at both ends, disposed coaxially with said heat-recoverable member, and adapted to be deformed to grip a substrate, said deformation resulting from force exerted on the sleeve by the heat-recoverable member when the heat-recoverable member is heated above its transition temperature and recovers in the direction of said sleeve.

4,296,956

CAM OPERATED LOCK, PARTICULARLY FOR DOORS

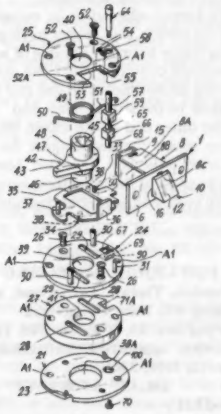
Angelo Colombo, Lazzate, Italy, assignor to Valli & Colombo S.p.A., Italy

Filed Jul. 19, 1979, Ser. No. 58,957

Claims priority, application Italy, Aug. 8, 1978, 26568 A/78; Oct. 27, 1978, 23159/78[U]

Int. Cl.³ E05C *1/16*

U.S. Cl. 292—169.18 **17 Claims**



1. A door lock comprising:

latch means adapted to be mounted in a door or the like, said latch means including a tubular guide and a latch member mounted for reciprocation therein between a latched position and an unlatched position;

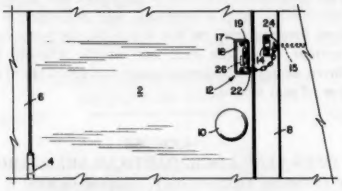
a housing assembly adapted to be mounted in a door;
a slide member mounted for reciprocation in said housing assembly and coupled to said latch member, said slide member including a thrust portion fixed thereto;
a single cam member rotatably mounted in said housing assembly having an eccentric portion and a central hub portion having a bore formed therethrough adapted to receive a shaft therein, the axis of said bore being substantially coincident with the axis of rotation of said cam member;
said slide member thrust portion being situated in the path of said cam member eccentric portion so that when said cam member is rotated, said eccentric portion will engage said thrust portion to move said slide member;
stop means fixed within said housing assembly; and
first spring means for urging said cam member in a direction such that said eccentric portion normally engages said stop means.

4,296,957

CHAIN-LOCK ACTUATED MAGNETIC SWITCH

David E. Belles, Pittsford, N.Y., assignor to Lok-A-Wat, Inc., Adamsville, Tenn.

Filed Sep. 24, 1979, Ser. No. 78,132
Int. Cl.³ E05C *17/36, 13/10*
U.S. Cl. 292—264 **3 Claims**



1. A chain-lock actuated magnetic switch for use with a door having a stile, and a frame for the door having a striker jamb comprising:
a magnet-responsive switch adapted to be mounted on a door striker jamb and having a normal circuit-controlling condition and being magnetically actuatable to an abnormal circuit-controlling condition,
a chain-lock keeper adapted to be mounted on a door stile opposite the switch, said keeper having a permanent magnet whose flux is normally capable of actuating the switch to its abnormal condition when the door is closed,
a chain having anchor means on one end thereof for anchoring the same to the striker jamb, and
a bolt on the other end of the chain, said bolt constituting pole piece means for said magnet for shunting the flux thereof when said bolt is seated home in said keeper whereby to prevent the same from actuating said magnet-responsive switch to said abnormal condition.

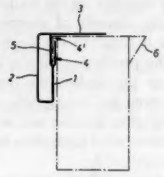
4,296,958

HOLDER FOR LIQUID PACKAGING CONTAINERS

Roelof J. Stranders, Thalwil, Switzerland, assignor to Werner Weber Holding AB, Baar, Switzerland

Filed Jan. 24, 1980, Ser. No. 114,788
Claims priority, application Switzerland, Feb. 9, 1979, 1310/79; Mar. 12, 1979, 2344/79
Int. Cl.³ A47B *95/02*
U.S. Cl. 294—27 H **9 Claims**

1. A detachable container holder for liquid packaging containers having upstanding front and rear walls, side walls extending between said front and rear walls and end margins of said side, front and rear walls defining flaps infolded into overlapping relationship to form an end closure of the container, wherein said holder incorporates a first supporting element arranged to lie at least partly along the rear wall of the container, handle means associated with said first supporting element, a further supporting element integral with said first supporting element and being arranged to engage a further



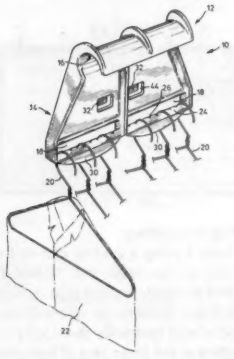
portion of the container, and retaining means provided on one of said supporting elements and arranged to receive and retain the flap defined by the upper end margin of the container end wall when said flap is pried away from the infolded closed position.

4,296,959

RACK HANGING DEVICE FOR GARMENTS

Rolf W. Helbig, 24-6679 Shelter Bay Rd., Mississauga, Ontario, Canada (L5N 2A2)

Filed Jul. 2, 1979, Ser. No. 53,914
Int. Cl.³ A47J *51/084*
U.S. Cl. 294—143 **7 Claims**



1. A device for supporting a plurality of hangers such as garment hangers or the like, comprising:
a substantially planar lower leg portion having a front side and a rear side;
an upper channel portion for pendently supporting the device, and having a concave surface defining a rearwardly and downwardly facing hook;
said substantially planar leg portion having at least one aperture for a plurality of garment hangers or the like; and
a lifting lug formation on the front side of said substantially planar lower leg portion beneath said rearwardly and downwardly facing hook, comprising at least one forwardly directed lug and at least one downwardly directed flange spaced at a distance from the front face of said substantially planar lower leg portion so as to provide a counter-bearing surface for an operating member to be engaged therewith.

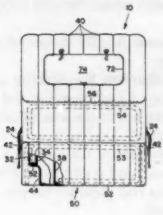
4,296,960
INFLATABLE CAMPER

Loren R. Winchester, 105 Southwest St., Yorktown, Ind. 47396

Continuation-in-part of Ser. No. 52,486, Jun. 7, 1979, abandoned. This application Sep. 21, 1979, Ser. No. 77,857

Int. Cl.³ B60P *3/32*

U.S. Cl. 296—167 **4 Claims**



1. An inflatable camper for pickup trucks comprising:

four generally rectangular inflatable walls including a front wall, a rear wall, and two side walls;

valve means in at least one of said inflatable walls for inflating or deflating same;

an inflatable top connected to said inflatable walls;

flexible floor means connected to a base of said inflatable walls;

internal wall means of said inflatable walls and top to help form said inflatable camper in a general external configuration similar to a pickup truck camper, said internal walls allowing air flow therethrough for said inflating or deflating;

entrance opening in said rear wall for allowing entry into said inflatable camper;

portholes in said inflatable walls to allow light into said inflatable camper, said portholes being covered by flexible releasable transparent material;

screen means secured at said portholes and said entrance opening to prevent most insects from entering said inflatable camper;

flexible door means removably connected to said rear wall for closing said entrance opening;

zipper means for holding said flexible transparent material in position to cover said portholes and to hold said flexible door means and said screen means at said entrance opening; and

magnetic strips embedded in said flexible floor means to magnetically hold said flexible floor to the contour of the bed of said pickup truck and embedded in portions of said inflatable walls to magnetically attach to contiguous portions of said pickup truck.

4,296,961
OPENING ROOFS FOR VEHICLES

Keith R. Hunt, Devon, and Sidney E. Fisher, Birmingham, both of England, assignors to Britax Weathershields Limited, Birmingham, England

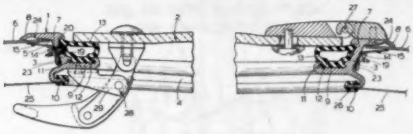
Filed Oct. 18, 1979, Ser. No. 85,862

Claims priority, application United Kingdom, Oct. 18, 1978, 41037/78; Jan. 23, 1979, 02430/79

Int. Cl.³ B60J *7/18*

U.S. Cl. 296—216 **9 Claims**

1. An opening roof for a vehicle having a roof provided with an opening comprising a frame for surrounding said opening and including spaced side members and spaced end members, and a panel assembly co-operating with said frame and movable with respect to said frame to expose portions of said opening for ventilation purposes, wherein said frame includes a flange adapted to overlie a portion of said roof surrounding said opening, said flange having an inner edge and a web depending from said inner edge of said flange and having an outer face, a lower end, and being provided with openings, and clamping means are provided to clamp said flange against said roof, said clamping means comprising a separate resilient clamping strip extending along each of said side members and along each of said end members of said frame, each of said clamping strips including a generally flat base which is clamped against said outer face of said web and an integral



clamping tongue which is inclined to said base at an obtuse angle and projects from one edge of said base to engage with a face of said roof remote from said flange, and screws which project through said openings in said webs to urge said flat base into engagement with said web and said flange into engagement with said roof.

4,296,962
WIND DEFLECTOR FOR SLIDING ROOFS OF MOTOR VEHICLES

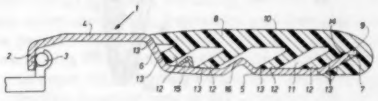
Hans Jardin, Inning, and August Hirschberger, Munich, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 80,022

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 7828941[U]

Int. Cl.³ B60J *7/18*

U.S. Cl. 296—217 **14 Claims**



1. Wind deflector for sliding roofs of motor vehicles, said deflector being mountable near the forward edge of a roof opening so that it is swivelable near its forward edge about an axis which runs at right angles to the lengthwise axis of the vehicle, and being comprised of a sheet metal strip and an overlying plastic strip connected thereto, characterized by the fact that the plastic strip is mounted upon said sheet metal strip with a rear edge of the sheet metal strip retained within a groove formed in said plastic strip.

4,296,963
FIREARM SHOOTING SUPPORT TABLE

Kenneth G. Blanchard, Rt. 5, Box 484, and Reuben N. Ronne, Rte. 3, Box 470 R, both of Detroit Lakes, Minn. 56501

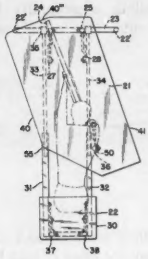
Filed Oct. 16, 1979, Ser. No. 85,213

Int. Cl.³ A47B *83/02, 3/14*

U.S. Cl. 297—170 **2 Claims**

1. A shooting table device comprising a table for supporting a firearm, a seat for supporting an operator while firing the firearm, with the firearm supported on the table, said table having a pair of front legs pivotally mounted to the front of said table and adapted to extend vertically from said table for supporting said table, at least one telescoping horizontal supporting means, one end of said telescoping means being pivotally mounted to the front legs of said table at a height intermediate the height of said table, the telescoping means having its other end fixed to said seat, said pivotal mounting of said one end of said telescoping means to said front legs of said table serving as front legs for said seat, said seat having a pair of legs

mounted to support said seat at its rearward end, said telescoping means enabling said seat to be adjusted forward and rearward with respect to said table, said table extending in length at an angle across said seat, said table having a leg at its rearward end to support the rearward end of said table.

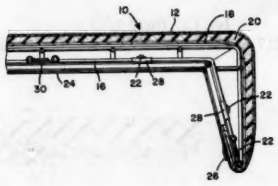


4,296,964

STRUCTURAL COMPONENT FOR UPHOLSTERED FURNITURE AND METHOD OF MAKING

Dennis A. Haack, Troy, Ohio, assignor to Denack Design Corporation, Troy, Ohio

Filed Sep. 14, 1979, Ser. No. 75,449
Int. Cl.³ A47C *31/02*
U.S. Cl. 297—218 **16 Claims**



1. A structural component for upholstered furniture, comprising: a three-dimensional wire frame including a plurality of wires welded together to form a wire mat,

said wire frame including a border wire extending adjacent the outer edge of said frame,

upholstery means including a flexible sheet substrate and an upholstery material cover with padding means disposed between said substrate and said cover,

means securing an outer edge portion of said upholstery material cover to an adjacent outer edge portion of said substrate to confine said padding means and to form an upholstery assembly,

said upholstery assembly covering said wire frame, and

plastic clip means attaching said upholstery assembly to said border wire of said wire frame.

4,296,965

SEAT WITH ADJUSTABLE LUMBAR SUPPORTER

Kenichi Sakurada, Yokohama, and Takaichi Nishino, Hachioji, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Tachikawa Spring Company, Limited, Akishima, both of, Japan

Filed Jul. 11, 1979, Ser. No. 56,607
Claims priority, application Japan, Jul. 31, 1978, 53-93776
Int. Cl.³ A47C *7/46*
U.S. Cl. 297—284 **8 Claims**

1. A seat with a backrest having spaced support portions by which a contourable portion constituted by padding means is supported, and an adjustable lumbar supporter for imparting a curvature to said contourable portion to produce a desired contour, said lumbar supporter comprising:

a first rod member transversely crossing said support portions in a manner so as to be rotatable about the axis thereof relative to said support portions;

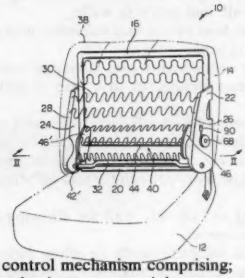
an arm member secured at its one portion to said first rod member to be rotatable therewith;

a second rod member held by said arm member in a manner so as to be rotatable about the axis thereof relative to said arm member;

lumbar pressing means fixedly mounted on said second rod member;

a first control mechanism for forcing a unit of said arm member, said second rod member and said lumbar pressing means to swing about the axis of said first rod member when operated; and

a second control mechanism for forcing a unit of said lumbar pressing means and said second rod member to swing the axis of said second rod member relative to said arm member when operated;



said first control mechanism comprising;

a first cam having a cam periphery operatively contacting said second rod member;

a first axle member connected to said first cam to be rotatable therewith about the axis of said first axle member; and

first stopping means for causing said axle member to assume a predetermined rest position under rotation thereof;

said second control mechanism comprising:

a second cam supported via a pivot by said arm member and having therein an elongated slot;

a stud secured to said lumbar pressing means and movably received in said elongated slot of said second cam;

second stopping means for causing said second cam to assure a predetermined rest position under the swingable rotation of it about said pivot;

a second axle member; and

a linkage operatively interposed between said second axle member and said second cam in such a manner that when said second axle member is rotated about the axis thereof, said second cam is swung about said pivot.

4,296,966

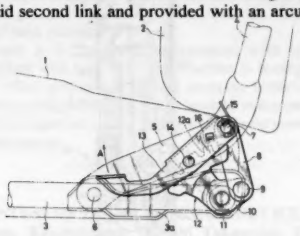
SEAT FOR AN AUTOMOTIVE VEHICLE

Takami Terada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya and Shatai Kogyo Kabushiki Kaisha, Yamato, both of, Japan

Filed Oct. 3, 1979, Ser. No. 81,459
Claims priority, application Japan, Oct. 18, 1978, 53-128944
Int. Cl.³ A47C *1/025*
U.S. Cl. 297—369 **6 Claims**

1. A seat for an automotive vehicle having a back rest disposed tiltably relative to said seat and at least one adjusting mechanism for adjusting the angle of said back rest relative to said seat, said back rest having a pair of parallel side frame portions which extend forwardly and downwardly from the lower end of the back rest and which are pivoted at the free ends thereof to said seat, said adjusting mechanism comprising

a first link pivoted at one end thereof to one of said pair of parallel side frame portions at a point spaced from said pivoted free end, a second link rotatably connected at one end thereof to the other end of said first link and further pivoted at the other end thereof to said seat, a latch means integrally extending from said second link and provided with an arcuate series



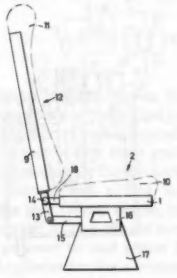
of teeth concentric to the pivoting axis of said second link to said seat, a manual handle pivoted to a part of said adjusting mechanism and having a pin for engagement with said teeth of said latch means and spring means normally urging said manual handle toward engagement with said teeth of said latch means so that said adjusting mechanism is locked and hence said back rest is locked in a selected position of reclination.

4,296,967

PASSENGER SEAT

Ignaz Vogel, Kleinsteinbacherstr. 44, Karlsruhe-Stu 41, Fed. Rep. of Germany (7500)

Filed Nov. 1, 1979, Ser. No. 90,245
Int. Cl.³ A47C *3/12, 5/12*
U.S. Cl. 297—451 **11 Claims**



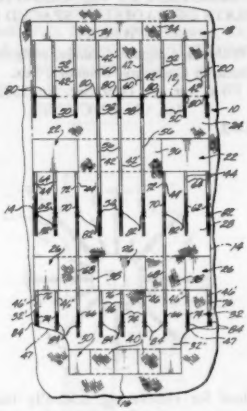
1. A passenger seat for people moving vehicles such as buses, railways cars, ships and airplanes, said seat comprising: a base; a seating member supported on said base; a backrest member mounted on said seating member, said seating and backrest members consisting of sandwiched plate structures each having spaced plates with a cellular structured core disposed therebetween and a sleeve fully incorporated into the sandwiched plate structure by being disposed between and firmly connected to each of said spaced plates, a bracket structure having its ends extending into the sleeves of said seating and backrest members and being mounted therein for supporting said backrest member on said seating member, and mounting means disposed at the underside of said seating member and connected to said sleeve incorporated in said seating member for supporting said seating and backrest members on said base.

4,296,968

IN SITU OIL SHALE RETORT HAVING HORIZONTALLY OFFSET PILLARS

Thomas E. Ricketts, Bakersfield, Calif.; Ned M. Hutchins, and Irving G. Studebaker, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 951,527, Oct. 16, 1978. This application Sep. 19, 1979, Ser. No. 77,024
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 **58 Claims**



1. A method for recovering liquid and gaseous products from an in situ oil shale retort formed in a retort site within a substerranean formation containing oil shale, such as in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, comprising the steps of:

excavating formation from within the retort site for forming an upper void extending horizontally across the retort site, leaving an upper zone of unfragmented formation above the upper void, and leaving at least a first pillar of unfragmented formation within the upper void for providing temporary support for the upper zone of unfragmented formation;

excavating formation from within the retort site for forming a lower void extending horizontally across the retort site, the lower void being spaced immediately below the upper void, leaving an intermediate zone of unfragmented formation extending horizontally across the retort site between the upper and lower voids, leaving a lower zone of unfragmented formation below the lower void, and leaving at least a second pillar of unfragmented formation within the lower void for providing temporary support for the intermediate zone of unfragmented formation, the second pillar being offset horizontally from the first pillar so that at least a portion of a floor of the upper void lies vertically above at least a portion of the second pillar;

placing explosive in the lower zone of unfragmented formation, at least a portion of such explosive being placed in at least one vertical blast hole extending from said portion of the floor of the upper void through the second pillar and into the lower zone of unfragmented formation below the second pillar;

placing explosive in the upper and intermediate zones of unfragmented formation;

detonating such explosive in the upper, intermediate and lower zones of unfragmented formation for explosively expanding formation within such zones toward the upper and lower voids for forming a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort;

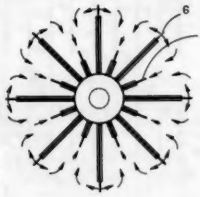
establishing a retorting zone in an upper portion of the fragmented mass;
introducing a retorting gas into the fragmented mass for sustaining the retorting zone and for advancing the retorting zone through the fragmented mass; and
withdrawing liquid and gaseous products of retorting from a lower portion of the fragmented mass on the advancing side of the retorting zone.

4,296,969

THERMAL RECOVERY OF VISCOUS HYDROCARBONS USING ARRAYS OF RADIALLY SPACED HORIZONTAL WELLS

Bertram T. Willman, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.

Filed Apr. 11, 1980, Ser. No. 139,618
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 **21 Claims**



1. A method for recovering normally immobile mineral values from a subterranean formation, the method comprising:
(a) penetrating said formation with an access shaft;
(b) extending first and second radially-spaced substantially horizontal wells from said shaft into said formation;
(c) extending a third substantially horizontal well from said shaft into said formation, said third well being located between said first and second wells and being substantially shorter than either of said first and second wells;
(d) injecting a mobilizing fluid into said first well and recovering mobilized mineral values via said second well so that a path of high fluid mobility is created in said formation between the ends of said first and second wells;
(e) injecting said mobilizing fluid into said first and second wells to further mobilize and drive mineral values through said formation to said third well, the end of said third well being located a sufficient distance from said high mobility path to provide for good sweep efficiency of the mineral values located between said first and second wells; and
(f) recovering said mobilized mineral values via said third well.

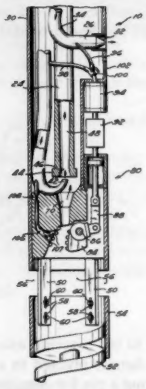
4,296,970

HYDRAULIC MINING TOOL APPARATUS

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Feb. 15, 1980, Ser. No. 121,712
Int. Cl.³ E21C *45/00*
U.S. Cl. 299—67 **11 Claims**

1. In a hydraulic mining tool for recovering minerals from subterranean formations, including a hydraulic cutting jet for dislodging said minerals from said formations and forming a resultant mineral slurry, and a hydraulic venturi pump for lifting said mineral slurry to ground surface, the improvement comprising:
an Archimedes screw carried on one end of said mining tool and disposed below said hydraulic venturi pump for transporting a continuous quantity of said minerals toward said hydraulic venturi pump; said Archimedes screw including a sleeve rigidly attached about a portion of its diameter to direct said continous quantity of minerals toward said hydraulic venturi pump; said Archimedes screw and said sleeve being axially spaced from said one end of said mining tool with said axial spacing defining a radial inlet for said mineral slurry into said hydraulic venturi pump;



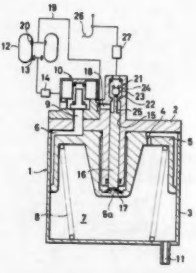
and said Archimedes screw and sleeve being mounted to said one end of said mining tool by means for adjusting said axial spacing to vary the size of said radial inlet.

4,296,971

ANTISKID DEVICE

Hiroshi Nakazato, Hanyu, Japan, assignor to Akebono Brake Industry Co., Ltd., Saitama, Japan

Filed Nov. 27, 1979, Ser. No. 97,891
Claims priority, application Japan, Nov. 30, 1978, 53-165254[U]
Int. Cl.³ B60T *8/10*
U.S. Cl. 303—115 **6 Claims**



1. An antiskid pressure reducing device comprising:
a closed casing;
a power piston located within said casing and dividing the interior of said casing into two pressure chambers and said power piston is movable by differential pressure developed between said two pressure chambers by detection of a skidding state of a wheel;
a brake device;
a pressure source;
a braking pressure transmission line arranged between the pressure source and the brake device;
a valve mechanism arranged to close said braking pressure transmission line;
a pressure reducing chamber disposed between said valve mechanism and said brake device;
said casing including a cylinder containing said valve mechanism;
a plunger slidable within said cylinder, said plunger being

arranged to receive pressure at one end thereof from said pressure reducing chamber; and

a spring means disposed between the other end of the said plunger and said power piston for spacing them a given distance apart, said spring means being arranged to push said plunger with a force greater than the sliding resistance of said plunger;

said plunger is in operative engagement with said valve mechanism; and said valve mechanism is arranged to be closed when pressure from said pressure reducing chamber causes said plunger to move toward said power piston against the force of spring means even if said power piston does not move.

4,296,972

ANTI-SKID BRAKE CONTROL DEVICE

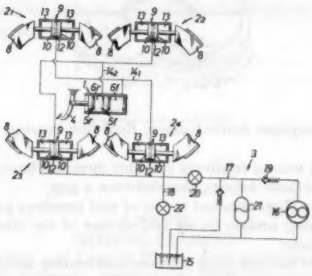
Makoto Sato, Kamifukuoka; Hiroshi Takamatsu, Ohimachi; Yoshitaka Miyagawa, Kawagoe, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 871,186, Jan. 20, 1978, which is a division of Ser. No. 762,782, Jan. 25, 1977, Pat. No. 4,129,342. This application Jun. 20, 1979, Ser. No. 50,204

Claims priority, application Japan, Jan. 29, 1976, 51/8682; Feb. 2, 1976, 51/10195; Feb. 16, 1976, 51/15607

Int. Cl.³ B60T *8/08, 13/68*

U.S. Cl. 303—119 **1 Claim**



1. An anti-skid brake control system for use with four wheeled vehicles, comprising: a brake fluid pressure producing unit, said unit having a pair of two independent power chambers defined therein; a pair of first front and rear wheel cylinders each having a piston slidable therein with a brake applying element connected thereto and a first hydraulic chamber formed therein on one side of said piston, said first hydraulic chamber being connected to one of said power chambers for applying hydraulic pressure to said piston for brake application; said rear wheel cylinder having a second hydraulic chamber formed therein, on the opposite side of said piston and being hydraulically connected to high and low pressure lines for applying a regulated hydraulic pressure to said piston for counteracting hydraulic pressure applied thereto; a pair of second front and rear wheel cylinders, each having a corresponding piston slidable therein with a brake applying element connected thereto and a third hydraulic chamber formed therein on one side of said last-named piston, said third hydraulic chamber being connected to the other of said power chambers for applying hydraulic pressure to said last-named piston for brake application; said second rear wheel cylinder having a fourth hydraulic chamber formed therein on the opposite side of said last-named piston and being hydraulically connected to said high and low pressure lines for applying a regulated hydraulic pressure to said last-named piston for counteracting hydraulic pressure applied thereto; a first control valve interposed in said high pressure line for selectively establishing and blocking hydraulic communication between said second and fourth hydraulic chambers and a hydraulic pressure source; a second control valve interposed in said low pressure line for selectively establishing and blocking hydraulic communication between said second and fourth hydraulic chambers and a hydraulic reservoir; and means for sensing locking of said rear wheels to properly control said first and second valves such that pressure in said second and fourth hydraulic chambers is reduced when at least one of said rear wheels is being locked.

4,296,973

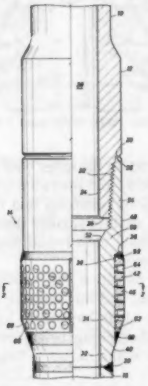
SEGMENTED HARDFACED COLLAR FOR TOOL JOINTS

Charles A. Hartwell, P.O. Box 36589, Houston, Tex. 77036

Filed Jan. 9, 1980, Ser. No. 110,646

Int. Cl.³ F16C *29/02*

U.S. Cl. 308—4 A **5 Claims**



1. In a well pipe tool joint formed of a lower threaded tubular body serially affixed to a drill pipe and adapted to be connected with a complementary threaded tubular tool joint body for supporting a drill string, the improvement which comprises wear protector means extending circumferentially about the lower tubular body in an axially extending region wherein said wear protector means comprises an elongate, externally located tubular sleeve terminating at a lower circumferential shoulder located on the lower tubular body at or beyond a specified distance from a weld joining the lower tubular body to a lower pipe and which wear protector means has the form of an encircling cylindrical sleeve supporting hard metal facing thereon wherein said sleeve extends externally upwardly toward a shoulder on the lower tubular body defining a throat area within the lower tubular body which throat area is equal to or exceeds a specified dimensional size from the shoulder to a set of threads formed on the interior of the lower tubular body and wherein said sleeve terminates at a sloping circular shoulder constructed at an angle and extent in accordance with an industry standard and at least one hole drilled therein at said sloping shoulder has a hard metal facing insert therein.

4,296,974

LINEAR BALL BEARING UNIT

Hiroshi Teramachi, 2-34-8 Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan (158)

Filed Feb. 11, 1980, Ser. No. 120,670

Claims priority, application Japan, Feb. 14, 1979, 54-15911

Int. Cl.³ F16C *29/06*

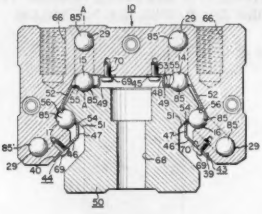
U.S. Cl. 308—6 C **2 Claims**

1. A linear ball bearing unit, comprising:

a bearing body having a cavity of substantially trapezoidal shape in section and provided with longitudinal ball grooves with the same radius of curvature as the balls along four corners of said cavity and longitudinal ball

recirculating holes extending parallel with the respective ball grooves in radially spaced positions;

end lids to be attached to the opposite ends of said bearing body through aligning bushes and provided with turn grooves of U-shape in section to interconnect the opposing ball grooves and ball recirculating holes of said bearing body, said end lids having square recesses at opposite sides of said U-shaped turn grooves to receive a guide strip across each U-shaped groove, said guide strip having a semi-cylindrical ball guide portion over the entire width of said U-shaped groove;



retainers to be fitted on the inner wall surfaces of said cavity of the bearing body and provided with longitudinal slits in horizontal portions opposing said ball grooves, said slits having a width slightly smaller than the diameter of balls and being provided with round tongues integrally at opposite ends thereof;

a number of balls placed in the bearings constituted by said bearing body and end lids through said retainers; and

an longated track shaft located in said cavity and having longitudinally therealong ball grooves of a radius of of curvature same as the radius of load-carrying balls.

4,296,975

DEVICE FOR TRANSMITTING LINEAR MEASURING MOTION

Lars Ö. Forsman, Helsingborg, Sweden

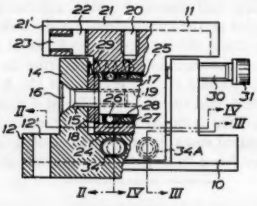
PCT No. PCT/SE78/00076, § 371 Date Jul. 10, 1979, § 102(e) Date Jul. 10, 1979, PCT Pub. No. WO79/00292, PCT Pub. Date May 31, 1979

PCT Filed Nov. 13, 1978, Ser. No. 118,802

Claims priority, application Sweden, Nov. 14, 1977, 7712828

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—6 R **7 Claims**



1. A device for providing linear measuring motion comprising:

a U-shaped element and a T-shaped element, the stem of the T-shaped element being received between the limbs of the U-shaped element, so that said elements are relatively displaceable with respect to one another, so as to provide said linear measuring motion;

a body fixedly connected to said U-shaped element and received in a cylindrical opening extending through the stem of the T-shaped element;

the T-shaped element being mounted to said body by ball bearing means for allowing relative axial motion of said stem of the T-shaped element between the limbs of said U-shaped element and rotational motion of said T-shaped element about said body; and

means for preventing said rotational motion and ensuring accurate guidance of said elements during relative axial displacement thereof, comprising anti-friction bearing means disposed on at least one axial race between said T-shaped element and said U-shaped element.

4,296,976

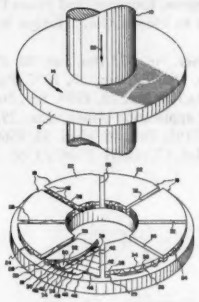
CROSS-PLIES SUPPORT ELEMENT FOR COMPLIANT BEARINGS

Hooshang Heshmat, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Apr. 3, 1980, Ser. No. 136,958

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—9 **10 Claims**



1. A compliant hydrodynamic fluid film bearing, comprising:

first and second relatively movable members having opposing surfaces defining therebetween a gap;

a bearing sheet attached to one of said members and having a bearing surface facing said surface of the other of said members;

a support element lying between said bearing sheet and said one member, and supporting said bearing sheet on said one member;

said support element including a first corrugated foil module lying on said one member and formed as a plurality of strips whose length runs generally perpendicular to the axis of said corrugations;

a second corrugated foil module lying between said bearing sheet and said first corrugated foil module, formed as a plurality of strips whose length runs generally perpendicular to the axis of its corrugations and to the strips of said first corrugated foil module;

said support element thereby forming a matrix of substantially independently compliant support zones including a plurality of zones in orthogonal directions distributed across the area of said support element, each zone of said support element having an angular compliance that is substantially equal about orthogonal axes directions in the plane of said bearing sheet.

4,296,977

SELF-ALIGNING SHAFT BEARING MOUNTING ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

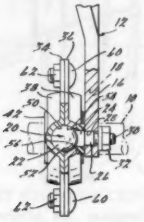
Filed Jan. 11, 1980, Ser. No. 111,449

Int. Cl.³ F16C *13/02*

U.S. Cl. 308—19 **7 Claims**

1. A pivotable shaft bearing mounting assembly comprising a supporting strut, a pair of ball-studs each formed with a ball and a shank affixed in spaced relationship to said strut, a bearing carrier comprised of a pair of overlying plates each formed

with an aligned central aperture and an encircling outwardly projecting annular flange defining therebetween a tubular bearing housing, a bearing including an annular outer race disposed with its periphery clamped within said housing, an annular inner race adapted to receive and rotatably support a shaft, and a plurality of anti-friction elements interposed between said outer and inner race, each of said plates formed with a pair of substantially hemispherical opposed cavities



defining a pair of ball sockets disposed at diametrically spaced positions on each side of said central aperture, said carrier formed with access ports for receiving said shank of said ball-studs in radial-spaced clearance relationship, and fastening means for securing said plates together in face-to-face relationship to clamp said bearing in said housing and said balls in said sockets permitting pivoting movement of said carrier about an axis passing through said balls.

4,296,978

SLIDING BEARING

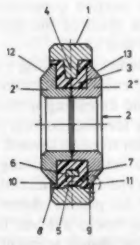
Norbert Löser, and Leopold Tilgner, both of Heusweiler, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,647

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 7837851

Int. Cl.³ F16C *17/10*

U.S. Cl. 308—37 **6 Claims**



1. A bearing for transmitting radial and axial forces, comprising an inner and an outer bushing, one of said bushings being provided with flanges projecting radially to at least partially embrace the other bushing thus fixing the other bushing therebetween, a sliding annular insert having a U-shaped cross-section of antifriction material being arranged between said bushings, and having annular projections extending axially outward to embrace said flanges of said one of said bushings.

4,296,979

JOURNAL BEARING FOR THE SHAFT OF A WATER PUMP OR THE LIKE

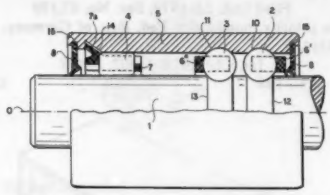
Heinrich Hofmann, and Günther Markfelder, both of Schweinfurt, Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,027

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907342

Int. Cl.³ F16C *19/49, 19/18, 33/46*

U.S. Cl. 308—174 **4 Claims**



1. In an assembly of a rotatable shaft and a journal bearing therefor,

the improvement wherein said journal bearing comprises: a sleeve with a cylindrical inner peripheral surface having a first zone with two closely spaced annular track grooves offset from the axial midpoint of the sleeve adjacent one end thereof and a second zone with an annular retaining groove adjacent the other end thereof, said shaft being provided with two closely spaced peripheral track grooves respectively confronting the annular track grooves of said first zone;

two sets of balls respectively received in said track grooves of said shaft and said sleeve, the balls of each set being respectively engaged by a first and a second cage;

a set of rollers inserted in said second zone between said shaft and said sleeve; and

a third cage engaging said rollers, said third cage being provided with a peripheral rib snap-fitted into said retaining groove.

4,296,980

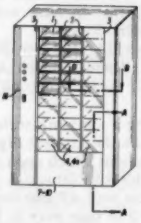
AUTOMATON FOR DEALING OUT FOOD AND DRINK

Tauno K. Takaniemi, Näsilinnankatu 30 B 31, SF-33200 Tampere 20, Finland

Filed Jun. 20, 1979, Ser. No. 50,846

Int. Cl.³ A47F *3/02*; B65B *59/00*; B65D *83/08*

U.S. Cl. 312—35 **8 Claims**



1. An apparatus for dispensing products, comprising:

a plurality of product receiving shelf spaces arranged one above the other;

a door comprising a corresponding plurality of interconnected panels each sized to close one of said product receiving shelf spaces, said door being arranged for movement due to the effects of gravity, downward past said shelf spaces; and

means for selectively stopping movement of said door

downwardly past said shelf spaces to permit serial removal of products from said shelf spaces.

4,296,981

DESK WITH A CHANNEL FOR RECEIVING CABLES, WIRES ETC.

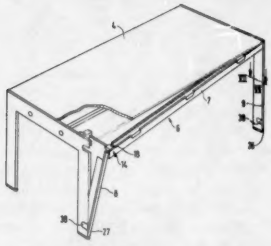
Norbert Hildebrandt, Grüner Winkel 32, 4782 Erwitte 1; Norbert Becker, Weringhauser Str. 15, 4782 Erwitte 2; Rolf Walter, Jägergasse 1, 6302 Lich 4, and Manfred Hoffman, Bahnhofstrasse 23, 6305 Grossen Buseck I, all of Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 87,179

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 7831436

Int. Cl.³ A47B *13/02, 77/08*

U.S. Cl. 312—194 **13 Claims**



1. In a desk having a first channel which extends directly below and parallel to the table top of the desk at the back side of the desk, which channel can be pulled out from and is guided in the desk, which channel is of U- or L-shaped cross section for receiving cables and wires, the outer leg of which channel is in alignment, in its retracted condition, with the desk wall and has openings for facilitating an exiting of cables and wires, the improvement comprised in that said first channel opens upwardly and in its retracted condition is closed by said table top, at least on one end of said first channel there is secured a further channel which extends vertically downwardly from the horizontally extending first channel, said further channel being movable with said first channel, said further channel being movable into a recess in a base of the desk, said further channel being open to said horizontally extending first channel, and including webs extending longitudinally in and subdividing both channels.

4,296,982

KNOCK-DOWN CABINET ASSEMBLY

Jan O. Kullander, Säffle, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

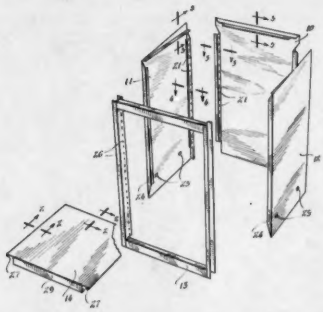
Filed Nov. 14, 1979, Ser. No. 94,346

Claims priority, application Sweden, Apr. 9, 1979, 7903120

Int. Cl.³ A47B *43/00;* **A47F** *5/00*

U.S. Cl. 312—257 R **5 Claims**

1. A cabinet having a top work surface comprising: a rear wall and two side walls, the adjacent edges of said rear and side walls having bent portions which upon abutment and pivoting hook one another to form a joint which prevents separatiion of said side walls and rear wall, a frame-shaped front wall having vertical posts adapted to snap over to join said front wall to said side walls to thereby form a box-like structure, the upper portions of both of said side walls and rear wall having inwardly directed horizontal portions, a top part having three edges bent back on itself in a reverse direction and terminating in an oppositely directed bent portion forming outwardly directed grooves between said bent back portion and said oppositely directed bent part, said grooves being adapted to engage with said inwardly directed horizontal portions, and wherein said top part is a flat plate forming a work surface, said upper parts of said side walls each being provided with a horizontal portion upon which the grooves of said top part are slid, and an additional part above said horizontal portion in the form of a triangular surface which forms an edge portion



projecting above the top surface of said top part, and whose height increases in a direction toward the rear wall of said cabinet.

4,296,983

EDGE JOINT FOR SHEETS

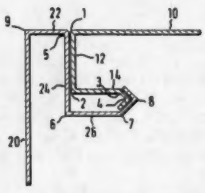
Stanley J. C. Rogers, Gravesend, and John F. Taplin, Thornton Heath, both of England, assignors to Vickers Limited, London, England

Filed Aug. 29, 1979, Ser. No. 70,714

Claims priority, application United Kingdom, Aug. 31, 1978, 35230/78

Int. Cl.³ A47B *47/02*

U.S. Cl. 312—263 **11 Claims**



1. A locking means for joining a pair of sheets together to form a corner comprising:

a first rigid planar portion connected at one end thereof directly to a first sheet of the pair of sheets to form a corner with that first sheet;

a first rigid hook member including a second planar portion connected at one end thereof to another end of said first planar portion and extending in the direction of the first sheet and a hook forming portion connected to said second planar portion to open toward the first sheet;

a second rigid hook member including a first planar segment connected at one end thereof directly to a first edge of the second sheet of the pair of sheets and extending away from that second hook, a hook forming segment connected to said first planar segment to open toward said first planar segment;

said hook forming portion receiving said hook forming segment and interlocking the sheets together with said second sheet first edge being immediately adjacent said first planar portion another end to form a joint between the two sheets which is located at a location spaced from the corner a distance corresponding to the length of said first planar portion and in a manner such that said first planar portion is coplanar with the second sheet, the

sheets being interlockable by superposing said first hook member over said second member with said second planar portion behind said first planar segment and with the edges thereof spaced slightly apart and relatively rotating the sheets to a fully interlocked position defined by abutment of such edges.

4,296,984

CABINET STORAGE CONVEYOR

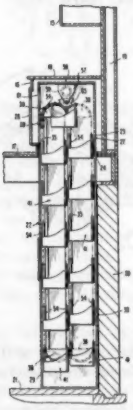
John C. Lehman, Marietta, Pa., assignor to John C. Lehman, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 883,294, Mar. 3, 1978. This application Nov. 6, 1979, Ser. No. 91,392

The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.

Int. Cl.[3] **B65G** *1/12;* **A47B** *49/00*

U.S. Cl. 312—268 **7 Claims**



1. A modular preassembled article storage and transport conveyor apparatus comprising a substantially rigid unitized support housing having at least one access opening in a side thereof, a pair of endless conveyor chains forming arcuate curved portions at opposite ends in offset relationship and disposed in laterally spaced parallel planes, each chain having multiple articulated links, plural spaced article storage and transport trays suspended at diagonally opposite corners in level relationship from said chains, said trays adapted to pass in succession adjacent to said at least one access opening of the housing, fixed guide track means for said chains on said housing and defining continuous substantially uninterrupted guidance paths for the endless chains along their entire movement paths, said fixed guide track means including arcuate support and guide portions for said arcuate curved portions of said chains and disposed interiorly of said chains, and power drive means for said chains on said housing including a pair of sprocket gears respectively in operative engagement with the exteriors of said pair of chains away from said arcuate support and guide portions and at a fixed point on the arcuate curved portion of each chain that face each other.

4,296,985

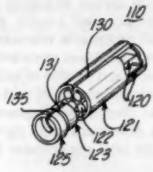
INTEGRAL ELECTRICAL CONTACT AND METHOD OF MAKING SAME

James J. Karol, Unadilla; Richard W. Normann, Otego, and Lloyd C. Hotchkiss, Downsville, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 9, 1979, Ser. No. 82,440

Int. Cl.[3] **H01R** *43/12, 43/14*

U.S. Cl. 339—48 **20 Claims**



1. An integral electrical contact comprising:

an elongated electrical and conducting base portion having first and second ends;

a plurality of electrical conducting wires integrally formed with the base portion; and

a like plurality of axially aligned raised design portions integrally formed with the base portion,

each of said wires being axially aligned with one of said raised design portions, each of said wires extending beyond the first end of said base portion and each including an end portion that terminates in an acutely angled surface,

said end portions being spreadable to receive a second plurality of electrical conducting wires.

4,296,986

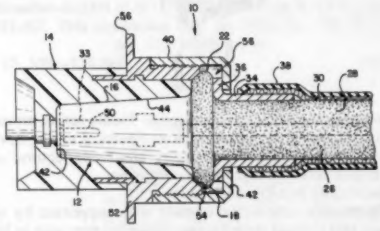
HIGH VOLTAGE HERMETICALLY SEALED CONNECTOR

Henry O. Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 18, 1979, Ser. No. 49,770

Int. Cl.[3] **H01R** *13/62, 14/648*

U.S. Cl. 339—89 C **7 Claims**



1. In a high voltage connector for terminating coaxial cable, of the connector type including an elastomeric plug member having a frustoconical profiled forward portion having first contact means therein connected to a cable center conductor; a receptacle member having a blind bore of complementarily tapered profile in a forward face for receiving the plug forward portion therein and second contact means in said bore mateable with said first contact means; and means for pressuring the plug member against a rearward wall within the receptacle bore, the improvement comprising:

said plug member having a rearward portion connected to a metallic outer shield of the cable, and an integral annular flange portion between said forward and rearward plug

portions having frontwardly, rearwardly, and outwardly facing surfaces, and said plug member having conductive coating means over said plug rearward portion and over said flange rearwardly and outwardly facing surfaces;

conductive collar means peripherally secured to a forward end of said receptacle member and having a flared portion diverging outwardly from said forward receptacle face, said plug flange being normally displaced from said receptacle forward face and said flared collar portion upon insertion of said plug forward portion into said receptacle bore; said pressuring means engaging against said plug flange rearward surface and axially pressing said plug member against said receptacle rearward wall, whereby,

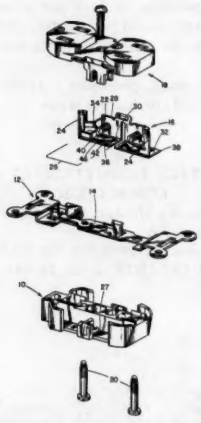
said forward plug portion flexes outwardly to conform to the interior dimension and profile of said receptacle bore, and, upon continued application of said pressuring means, said plug flange is compressed against said receptacle forward face, and influences said outward plug flange surface progressively into engagement against said flared collar portion.

4,296,987

PRESSURE LOCK TERMINAL

Bhartoor Lingaraju, Allentown, Pa., assignor to Square D Company, Palatine, Ill.

Filed Oct. 23, 1979, Ser. No. 87,369
Int. Cl.[3] H01R *4/26*
U.S. Cl. 339—95 D **2 Claims**



1. An improved electrical conductive double action pressure lock terminal assembly for use with an electrical wiring device capable of holding various diameter sized conductors, said pressure lock terminal assembly comprising:

an electrically non-conductive base;

an electrically conductive contact strip supported by said base, said contact strip having a main section with at least one jaw section extending from the end of said main section;

an electrically conductive double action pressure lock attached to and extending at a right angle from said main section such that said double action pressure lock is positioned a predetermined distance beneath said jaw section of said contact strip, said double action pressure lock comprising;

a spring support having a first and second end and an elongated interior opening, said spring support being attached to said contact strip along a predetermined portion of a first side of said spring support,

a spring arm having a first and second end, said first end of said spring arm being attached to said first end of said spring support, said spring arm lying within said interior opening of said spring support, and said second end being free,

a cavity stop means in said base, said stop means being positioned a predetermined distance beneath said first end of said spring support of said double action pressure lock;

whereby, when a conductor is inserted in said pressure lock assembly the conductor contacts said second end of said spring arm, causing said second end of said spring arm to deflect upward and in turn causing said first end of said spring arm and a portion of said spring support near said first end of said spring arm to contact said jaw section of said contact strip,

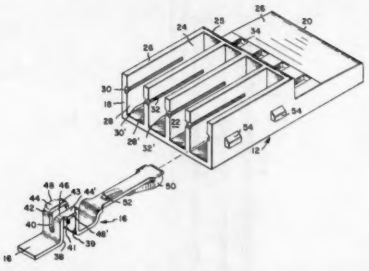
thereafter, as the conductor is inserted further into said pressure lock terminal assembly, said second end of said spring arm continues to deflect upward and said first end of said spring support rotates downward about said jaw section and eventually contacts said cavity stop in said base, thereby resulting in said second free end of said spring arm deflecting a greater amount than said first end of said spring arm, said deflections of said first and second ends of said spring arm resulting in a double action.

4,296,988

CONNECTOR WITH IMPROVED TERMINAL SUPPORT

Gary N. Warner, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 20, 1980, Ser. No. 122,932
Int. Cl.[3] H01R *11/20*
U.S. Cl. 339—97 R **5 Claims**



1. A pre-loaded electrical connector of the type comprising an insulating housing having a wire-receiving face and a cavity extending inwardly from said wire-receiving face, a wire admitting opening in said housing communicating with said cavity, said opening extending from said wire-receiving face partially along one external sidewall of said housing, said cavity having opposed internal endwalls extending normally of said one external sidewall, and an electrical contact terminal in said cavity, said terminal having wire-receiving means proximate to said wire-receiving face, said connector being characterized in that:

said wire-receiving means comprises at least one plate-like member disposed in said cavity at a location proximate to said wire-receiving face, said plate-like member being in a plane which extends substantially normally of said opposed internal endwalls and having an outer end which is proximate to said one external sidewall of said housing, a wire-receiving slot in said plate-like member extending inwardly from said outer end,

each of said opposed internal endwalls of said cavity having a supporting shoulder which is in a plane generally parallel to the plane of said one external sidewall, each said shoulder extending from said wire-receiving face into said cavity to said plate-like member,

said wire-receiving means having integral supporting projections extending laterally outwardly therefrom proxi-

mate said external sidewall and overlapping said shoulders,

said terminal having been axially inserted into

said cavity from said wire-receiving face whereby, upon locating a wire with its axis beside said one external sidewall in alignment with said wire admitting opening, and upon movement of said wire laterally of its axis, into said wire admitting opening and into said wire-receiving slot, said plate-like member is supported by said integral supporting projections and said member is stressed in tension.

4,296,989

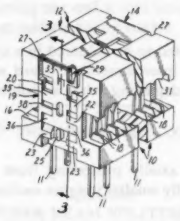
MULTI-CONDUCTOR FLAT CABLE CONNECTOR

Roderick W. Larson, Hudson, Wis., and Ralph D. Whaley, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 44,909, Jun. 4, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 128,527

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—99 R **8 Claims**



1. A multi-conductor flat cable connector comprising:

a base carrying a plurality of insulation stripping contact elements which extend from one surface of said base for making electrical connection to conductors of a said flat cable, said base being formed centrally at each end with a generally rectangular cover guide extending perpendicularly from said one surface,

a cover on said base formed at its ends to slidably mate with said cover guides on said base,

latching means on said cover including a pair of resilient metal latching legs, one extending from each end of said cover,

means for latching said latching legs to said base in an open position permitting a said flat cable to be inserted between said cover and said contact elements and for latching said latching legs to said base in a closed position whereat conductors of a said cable are connected by said contact elements, and

a pair of shearable latch stops, one at each end of said base, positioned to be contacted by portions of said latching legs when said connector is in an open position and shearable by said latching legs when said base and cover are forced together to move them to their closed position carrying the conductors of a said cable into said contact elements.

4,296,990

ELECTRICAL CONNECTOR HAVING INSULATED LOCKING SHELL FOR USE ON PANEL HAVING METAL GROUND PLANE

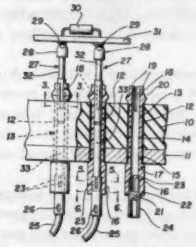
Jeffery P. Stowers, Mt. Sidney, and Kimball E. Stowers, Ft. Defiance, both of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.

Filed Feb. 22, 1980, Ser. No. 123,894

Int. Cl.³ H01R *13/627*

U.S. Cl. 339—128 **4 Claims**

1. An electrical connector for making a connection through a support panel having a metallic layer thereon and having an aperture formed entirely therethrough, said connection being between a conductor spaced from one side of the panel and a circuit element spaced from the other side thereof, said connector comprising a holding shell formed of insulating material and adapted for placement through said aperture of the panel and metallic layer with opposite end portions of the shell projecting beyond the opposite faces of the panel and metallic layer, said shell having a cross slot in one end thereof forming two yielding jaws, camming enlargements on said jaws including oppositely tapering faces engageable with the entrances of the aperture to collapse the jaws toward each other to enable inserting the shell through said aperture and withdrawing the shell therefrom, said shell being hollow, a spring contact probe snugly engaged within the shell and including a spring-biased



stem projecting beyond the slotted end of the shell and adapted for electrical engagement with said circuit element, an electrical terminal element for said conductor anchored to the end portion of said shell remote from its slotted end portion, and said spring contact probe including a sleeve body substantially filling the hollow shell and resisting collapse of said jaws while the spring contact probe is within the shell, the shell having an external shoulder near its end away from said camming enlargements adapted to abut one entrance of the aperture while the camming enlargements are abutting the other entrance with both oppositely tapering faces then disposed outside of the aperture to lock the shell within the aperture.

4,296,991

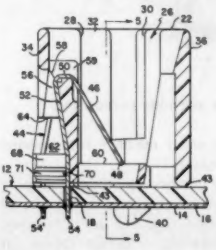
ELECTRICAL CONNECTOR RECEPTACLE

Donald W. K. Hughes, Mechanicsburg, and Ronald W. Myers, Landisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 940,536, Sep. 8, 1978, Pat. No. 4,221,458. This application Dec. 10, 1979, Ser. No. 101,676

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—176 MP **4 Claims**



1. An electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said opening having opposed first and second internal sidewalls and opposed internal endwalls, said housing having oppositely directed first and second external sidewalls, which are proximate to said first and second internal sidewalls respectively, and opposed external endwalls, a plurality of

spaced-apart side-by-side conductors, each of said conductors having a contact spring portion which extends from said first internal sidewall at a location adjacent to said plug-receiving end diagonally into said opening and towards said rearward end, said connector receptacle being characterized in that:

each of said conductors comprises a one-piece stamped and formed sheet metal member,

said first external sidewall has a plurality of side-by-side conductor-receiving channel means therein extending from said location adjacent to said plug-receiving end to said rearward end, every other said channel means being of increasing depth along its length from said location to said rearward end, the remaining channel means being of decreasing depth along their length whereby said channel means are alternately deep and shallow at said rearward end,

intermediate portions of said conductors being in said channel means, said conductors having reverse bends at said location and extending diagonally toward first end portions in said opening, second end portions of said conductors extending normally of, and beyond, said rearward end whereby,

said contact springs are formed between said reverse bends and said first end portions, and said second end portions of adjacent conductors are offset from each other and can be inserted into holes in a circuit board which are on staggered centers.

4,296,992

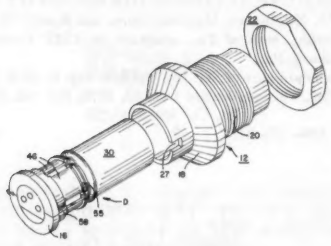
ELECTRICAL CONNECTOR ASSEMBLY

David A. Gallagher, Romeoville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 836,325, Sep. 26, 1977, Pat. No. 4,154,496. This application Apr. 9, 1979, Ser. No. 28,156

Int. Cl.³ H01R *13/506*

U.S. Cl. 339—186 M **16 Claims**



1. A connector assembly comprising:

a shell;

an elastomeric insert member for supporting at least one electrical contact;

a retaining ring comprising at least two portions which may be opened to receive said insert and closed to permit insertion of said ring and insert member into said shell, said ring including retention means for engaging and maintaining said insert member in fixed position within said ring and a plurality of radially movable axially extending arms for engaging said shell to maintain said ring and insert member in fixed axial position within said shell; and

a passageway providing access to said axially extending arms to permit disengagement of said ring and insert member from said shell.

4,296,993

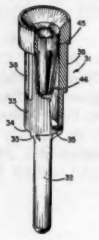
ELECTRICAL CONTACT WITH IMPROVED MEANS FOR SOLDER WICKING AND DEGASSING

Roger D. Wellington, Cumberland, R.I., assignor to Augat Inc., Attleboro, Mass.

Continuation of Ser. No. 936,485, Aug. 24, 1978, Pat. No. 4,236,776. This application Jan. 7, 1980, Ser. No. 109,850

Int. Cl.³ H01R *9/06*

U.S. Cl. 339—275 B **6 Claims**



1. A contact adapted to be soldered in a cylindrical plated-through hole in an interconnection board so as to facilitate solder wicking and degassing when so soldered, said contact comprising:

a cylindrical body, larger in diameter than said plated-through hole;

an elongated pin axially projecting from one end of and being substantially smaller in cross section than said cylindrical body;

a conical transitional surface connecting said cylindrical body and said pin; and

a plurality of ribs substantially parallel to and projecting outwardly from said transitional surface;

whereby when said contact is mounted in said plated-through hole with said pin projecting thereinto, said ribs make surface contact with the rim of said plated-through hole thereby spacing said transitional surface from said rim and providing escape paths for gases between said ribs and between said transitional surface and said rim.

4,296,994

METHOD AND APPARATUS FOR HOLOGRAPHIC PROCESSING

William H. Quick, La Habra Heights; Kenneth A. James, Corona Del Mar, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 22, 1979, Ser. No. 5,619

Int. Cl.³ G02B *5/32*

U.S. Cl. 350—3.73 **22 Claims**

1. A method of reporting the status of a physical parameter to a receiving station, the method comprising the steps of:

sensing said physical parameter;

supplying a first beam of light and varying the spectral wavelength distribution of said light beam as a function of the status of said parameter being sensed;

applying said spectrally-varied beam of light to a hologram for focusing responsive beams of light on an image plane at predetermined points, the locations of said points being responsive to an encoded signal that is dependent upon the spectral distribution of said beam of light; and

transferring said encoded signal to said receiving station by inputing said responsive beams of light to a light transmis-

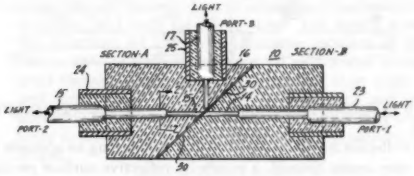
sion means having one end at said image plane and having another end at said receiving station.

4,296,995

OPTICAL FIBER BEAM SPLITTER COUPLERS EMPLOYING COATINGS WITH DICHROIC PROPERTIES

Gary W. Bickel, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 1, 1980, Ser. No. 117,425
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.15 **10 Claims**



1. An optical coupling device comprising:

a first optical layer having a front surface at a given angle, and having deposited directly thereon by an evaporation technique a plurality of relatively thin layers in excess of ten such layers of a material with dichroic properties capable of reflecting a first beam of light of a first frequency propagating in said fiber, and transmitting a second beam of light of a second frequency propagating in said first optical fiber,

a second optical fiber having a front surface at said given angle and adjacent said front surface of said first fiber to form an interface between said first and second surfaces to enable transmitted light at said second frequency to propagate within said second fiber with said second fiber receiving at least 80% of said light at said second frequency, and

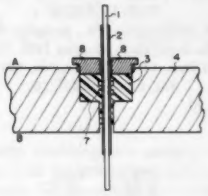
optical means positioned relatively transverse to said interface and adapted to solely receive reflected light at said first frequency from said interface as reflected by said thin layer with said optical means receiving at least 70% of said reflected light at said first frequency.

4,296,996

FEEDTHROUGH FOR OPTICAL FIBER

Yasuhiko Niiro, Yokohama; Kahei Furusawa, Kamifukuoka, and Akira Okada, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1979, Ser. No. 58,251
Claims priority, application Japan, Jul. 18, 1978, 53-86734
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **3 Claims**



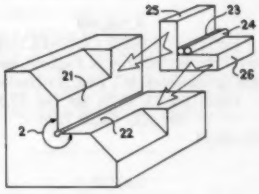
1. In a submarine repeater, a pressure-resisting solid container having a feed-through opening for receiving an optical fiber, an optical fiber extending longitudinally through said opening, a sealing thermoplastic material filling space between the fiber and inner surfaces of said through opening in said pressure-resisting solid container, said optical fiber having a metallic film coating circumferentially and longitudinally thereon in close contact with said sealing thermoplastic material to ensure a seal having resistance to high fluid pressure and airtightness between the optical fiber and said thermoplastic material, said metallic film coating having an oxide film thereon to provide enhanced sealing close contact between the metallic film coating and the thermoplastic material.

4,296,997

DEVICE FOR CENTERING AN OPTICAL FIBER WITHIN A TERMINAL, AND A TERMINAL CONSTRUCTED BY MEANS OF SAID DEVICE

Christian Malsot, and Jean Bouygues, both of Suresnes, France, assignors to Socapex, Suresnes, France

Filed Oct. 25, 1979, Ser. No. 88,458
Claims priority, application France, Oct. 31, 1978, 78 30849
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **7 Claims**



1. A device for centering an optical fiber within a connector terminal comprising:

a reference dihedron block having two faces, fabricated from a rigid material, one end thereof being adapted to receive the terminal;

a centering assembly adapted to be received by the other end of the reference dihedron block, including

two packing blocks of equal thickness, each such block being applied against a face of the reference dihedron block, and

two cylinders, each having a diameter equal to 2.421 times the diameter of the optical fiber in the case of a right dihedron, the cylinders being tangent to each other and

to at least one packing block, one of the cylinders being tangent to both packing blocks;

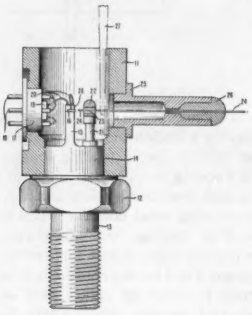
the centering assembly operating to position the optical fiber in the plane bisecting the dihedral angle defined by the faces of the reference dihedron block in a direction parallel to the edge of the dihedron block.

4,296,998

ENCAPSULATED LIGHT SOURCE WITH COUPLED FIBERGUIDE

William H. Dufft, Shillington, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1979, Ser. No. 104,364
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **4 Claims**



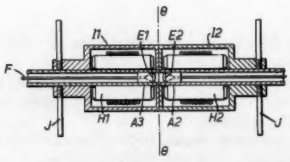
1. An encapsulated light source comprising a housing having walls, light generating means in the housing comprising a semiconductor light emitting device having a light output face, light transmitting means comprising a fiberguide penetrating a wall of the housing for transmitting light from the light emitting device to the exterior of the housing, a pedestal member within the housing having a top surface adjoining the light output face of the light emitting device, an unhoused body of low melting metal mounted on the top surface of the pedestal, the metal body having a portion of the fiberguide embedded therethrough to lock the fiberguide in position relative to the light output from the light emitting device.

4,296,999

OPTICAL FIBRE CONNECTORS

John F. Mead, Princes Risborough, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Oct. 23, 1979, Ser. No. 87,529
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **12 Claims**



1. An optical connector for the end of an optical fibre, comprising:

a hollow cylinder adapted to be secured to the end of said optical fibre;

an elongate housing assembly axially slidably mounted on said hollow cylinder and being intimately in contact therewith;

a main body secured to said hollow cylinder and also surrounding said elongate housing assembly, wherein said elongate housing assembly is axially slidable between said hollow cylinder and said main body; and

actuating means extending from said elongate housing assembly through said main body for enabling movement to be imparted to said elongate housing assembly externally of said main body;

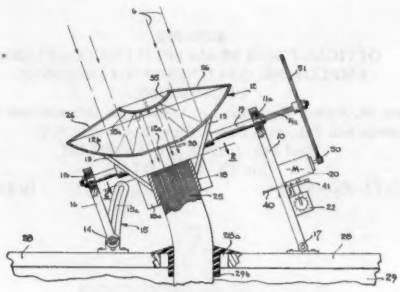
said optical connector being adapted to be mated to a further identical connector secured to the end of a further optical fibre having a hollow cylinder and a main body, with the ends of said hollow cylinders and said main bodies of respective said optical connector and said further optical connector abutting, and said elongate housing assembly moved axially to project within the main body of said further optical connector and to abut the elongate housing assembly thereof and to span the abutting ends of said hollow cylinders and said main bodies.

4,297,000

SOLAR LIGHTING SYSTEM

James E. Fries, 7860 Valley View, Apt. 242, Buena Park, Calif. 90620

Filed Jan. 11, 1979, Ser. No. 2,620
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.24 **12 Claims**



10. A lighting system employing solar light energy comprising:

a collector device in the form of a dish having an aperture in the center thereof, a parabolic reflective surface on one side thereof,

a fiber optical cable formed from a plurality of optical fiber lines joined together into a bundle,

ring holder means for holding one end of said fiber optical bundle together,

support means for supporting said collector device for rotatable movement about a predetermined axis,

means for supporting said ring holder means on said collector device for movement therewith with said one end of said cable on the opposite side of said collector device and facing directly opposite said aperture, the one end of the fiber optical bundle held by the ring holder means moving along with the collector device to maintain said one end of said cable facing directly opposite said aperture,

a convex mirror,

means for supporting said convex mirror on said collector device on said one side thereof approximately at the parabolic focal distance from said parabolic surface,

light utilization means,

means for coupling the other end of said cable to said light utilization means, and

means for slewing said collector device about said predeter-

mined axis so as to maintain said collector device directed at the sun,

whereby the sun's rays are focused on said convex mirror by said parabolic surface, said convex mirror directing the focused rays onto said one end of said fiber optical cable and transmitted to said light utilization means.

4,297,001

PROJECTION SCREEN AND METHOD FOR MAKING SAME

Gregor Antes, Zurich, and David L. Greenaway, Oberwil, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Continuation of Ser. No. 852,089, Nov. 16, 1977, abandoned. This application Nov. 16, 1979, Ser. No. 95,097

Claims priority, application Switzerland, Nov. 16, 1976, 14379/76

Int. Cl.³ G03B *21/60*

U.S. Cl. 350—129 **22 Claims**

1. In a method of producing an optical projection screen on a body,

the steps comprising:

forming a plurality of adjacent randomly distributed and irregularly sized micro-structural bubble-shaped elements on one major curved surface of said body, said bubble-shaped elements having a predetermined range of angles of inclination with respect to at least one direction tangent to said surface, and

limiting said predetermined range of angles of inclination by stretching said body by a first incremental length in said one direction, so that in an operative position of said screen light operatively incident on said screen is scattered therefrom in a predetermined plane at an angle to said surface and including said one direction within a selectable first scattering angle, said first scattering angle being at least partially dependent on said first incremental length.

4,297,002

ARRANGEMENT OF CYLINDER ELEMENTS FOR A LENS BARREL

Tsuneyo Meatabi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 6,973, Jan. 26, 1979, which is a continuation-in-part of Ser. No. 1,796, Jan. 8, 1979. This application May 13, 1980, Ser. No. 149,359

Claims priority, application Japan, Jan. 31, 1978, 53-8881

Int. Cl.³ G02B *7/02;* **G03B** *3/00*

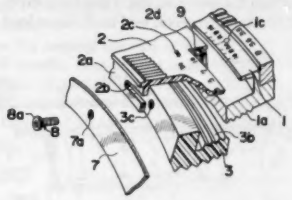
U.S. Cl. 350—255 **17 Claims**

1. An arrangement of cylinder elements for a lens barrel comprising;

an externally accessible outer cylinder element made of plastic material and having a central axis, an annular ridge carried on an inner peripheral surface of said outer cylinder element;

an inner cylinder element carried within said outer cylinder element;

an annular member being separate and independent from said outer and inner cylinder elements and being attachable to said annular ridge with an axis of said annular member being coincident with the central axis of said outer cylinder element, said annular member being made of a material which is stronger than said plastic material; and



means for fixedly attaching said annular member to said annular ridge with the axis of said annular member being coincident with the central axis of said outer cylinder element.

4,297,003

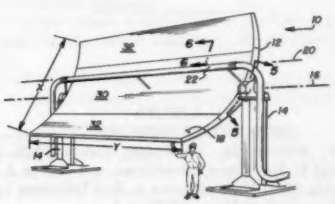
SOLAR COLLECTOR MODULE

Joseph A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Filed Oct. 19, 1979, Ser. No. 86,314

Int. Cl.³ G02B *5/10*

U.S. Cl. 350—292 **21 Claims**



1. A parabolic trough solar collector comprising: at least two collector modules, means rigidly connecting said modules together, each of said modules comprising at least two end skin members each having a front surface and a rear surface, said front surface of each of said end skin members being formed in a portion of a parabola; a rear stressed sheet metal skin rigidly affixed to at least a portion of said rear surface of each of said end skin members; a front stressed sheet metal skin rigidly affixed to at least a portion of said front surface of each of said end skin means; and a reflective surface on said front stressed sheet metal skin, said reflective surface being adapted to reflect solar radiation.

4,297,004

LIQUID CRYSTAL DISPLAY CELL

Katsuo Nishimura, and Takanori Nanya, both of Tokorozawa, Japan, assignors to Technical Research of Citizen Watch Co., Ltd., Tokorozawa, Japan

Filed Sep. 17, 1979, Ser. No. 76,189

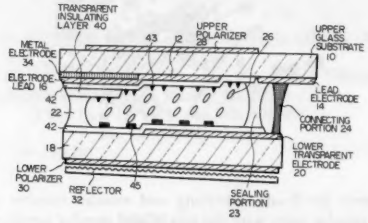
Claims priority, application Japan, Sep. 20, 1978, 53-114487; Oct. 26, 1978, 53-132029

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—336 **10 Claims**

1. In a liquid crystal display cell composed of two transparent supporting substrates arranged parallel to one another, sealed together peripherally to form an enclosed chamber containing a liquid crystal material, and having a transparent display electrode formed on an inner face of at least one of said transparent supporting substrates composed of a thin film of an

electrically conductive substance and a lead electrode provided on said inner substrate face for providing electrical connection between said transparent display electrode and external drive means, the improvement comprising a multi-layer construction for said lead electrode for thereby reducing the electrical resistance thereof, said multi-layer lead electrode



construction comprising a metallic electrode layer of a metallic substance formed on said inner substrate face and a lead electrode layer formed over said metallic electrode layer, said lead electrode layer being formed integrally with said display electrode and having a width which is substantially equal to the width of said metallic electrode layer, measured in a direction parallel to the substrate plane.

4,297,005

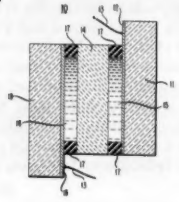
PERSISTENT MEMORY CELL

David W. Johnson, Jr., Pluckemin; Shobha Singh, Summit; LeGrand G. Van Uitert, Morristown, and George J. Zydzik, Columbia, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 25, 1979, Ser. No. 51,807

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **45 Claims**



1. An electrochemical display device comprising:
(a) first and second electrodes;
(b) electrochemical solution in contact with the first and the second electrodes;
(c) said electrochemical solution comprising:
i. organic quinone which changes color under the influence of an electrical signal,
ii. electrolyte,
iii. organic solvent capable of dissolving said organic quinone;
(d) characterized in that a solid cation ionic conductor separates the device into two cavities, each with its own electrode, one comprising the first electrode and the other comprising the second electrode and the two cavities are at least partially filled with said electrochemical solution.

4,297,006

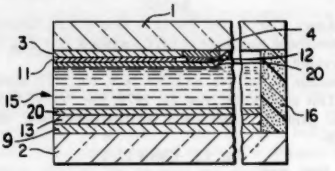
PROTECTIVE MEMBRANE FOR ELECTROCHROMIC DISPLAYS

Saadi J. Bissar, Waterbury, Conn., assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 973,833, Dec. 28, 1978, abandoned. This application Sep. 21, 1979, Ser. No. 77,863

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **25 Claims**



1. An electrochromic display having a display electrode with an electrochromic layer thereon, a counter electrode spaced from the display electrode and display electrolyte between the electrochromic layer and counter electrode, characterized in that a protective membrane is interposed between the electrochromic layer and electrolyte for protecting the layer from erosion resulting from contact with the electrolyte, said membrane comprising a mixture of:
(a) a long chain organic acid; and
(b) a compound selected from at least one of amine and amide present in an effective amount to form a salt with the organic acid imparting water repellency and ionic conductivity to said membrane for minimizing contact between said electrochromic layer and electrolyte while maintaining ionic conductivity therebetween for display purposes.

4,297,007

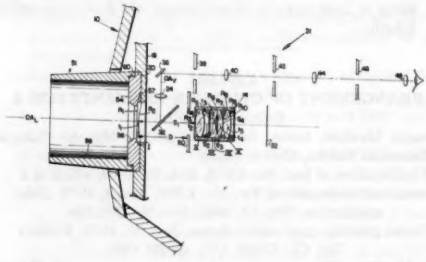
OPTICAL APPARATUS AND METHOD FOR CHANGING A ZOOM CAMERA TO A FIXED FOCUS CAMERA

R. Calvin Owen, Jr., Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1979, Ser. No. 32,969

Int. Cl.³ G02B *3/04, 9/60, 15/14*

U.S. Cl. 350—432 **8 Claims**



1. In combination with a fixed-focus, four-element air spaced lens having the following characteristics

Lens	n_d	V	Radii (in.)	Thickness (in.)
I	1.6911	54.8	$R_1 = .614$	$t_1 = .126$
			$R_2 = -1.245$	$s_1 = .133$
II	1.7508	27.8	$R_3 = -.450$	$t_2 = .040$
			$R_4 = .48$	$s_2 = .023$
III	1.6111	58.8	$R_5 = -2.0187$	$t_3 = .100$
			$R_6 = -0.5755$	$s_3 = .005$

-continued

Lens	n_d	V	Radii (in.)	Thickness (in.)
IV	1.6111	58.8	$R_7 = 0.599$ $R_8 = -0.5564$	$t_4 = .128$

wherein Roman numerals identify lens elements from front to rear; n_d is the refractive index; V is the Abbe number; R_1, R_2 . . . represent radii of successive refractive surfaces from front to rear; and t and s represent thickness of lens elements and air spaces respectively, an improvement comprising:

an aspheric corrector plate spaced ahead of element I of the four element lens by a predetermined distance, having an index of refraction, n_d, of 1.492, and Abbe V-number of 57.2, a plano front surface, and a concave rotationally symmetric aspheric rear surface facing element I and given by:

$$Z=0.170171y^4+1.47874y^6$$

where Z is the height of the asphere along the optical axis measured from a reference plane tangent to its vertex and perpendicular to the axis and Y is the radial distance of the aspheric surface from the optical axis.

4,297,008

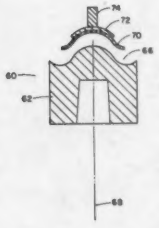
METHOD AND APPARATUS FOR MAKING A NON SPHERICAL BEVELED CONTACT LENS

Donald L. Woodford, 9925 Broadmoor Dr., Omaha, Nebr. 68114

Filed Jan. 16, 1979, Ser. No. 3,833

Int. Cl.³ B24B *9/14*; G02C *7/04*

U.S. Cl. 351—177 **5 Claims**



1. A method of producing a non-spherical bevel on the posterior surface of a contact lens comprising the steps of:

providing a rotatably mounted working surface having a central axis about which said working surface is symmetrical, said working surface further having a smooth three-dimensional curvilinear surface configuration generated by the rotation of an S-shaped curve produced by the circumferential arcs of two tantential conic-section curves about said central axis;

providing an abrasive material on said working surface;

rotating said working surface about said central axis; and

bringing the posterior surface of the contact lens into contact with said working surface to selectively abrade away portions of the posterior peripheral surface thereof.

4,297,009

IMAGE STORAGE AND DISPLAY

Reuben S. Mezrich, Miami, Fla.; Alec Colleoni, New Brunswick, and David J. Lyons, Trenton, both of N.J., assignors to Technicare Corporation, Solon, Ohio

Filed Jan. 11, 1980, Ser. No. 111,512

Int. Cl.³ G03B *21/32*

U.S. Cl. 352—86 **9 Claims**

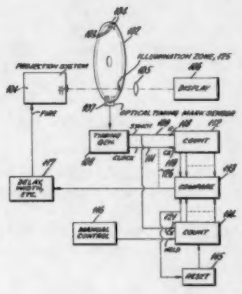
1. In a system employing a rotatable, disk-type phototransparency record of a plurality of sequentially associated images, said disk having said plurality of images sequentially, circumferentially disposed about a center of rotation, each image having a respectively associated reference timing indicium on said disk, a system for displaying said images comprising:

(a) a projection system for selectively, intermittently illuminating a zone of said disk through which said images pass upon disk rotation;

(b) means for displaying images on said disk which are so illuminated;

(c) means for sensing the rate of disk rotation and the position of specific ones of said images thereon by detecting movement of said indicia past a given point;

(d) means, responsive to said means for sensing, for generating a first pulse signal representative of frequency of said



detected movement, and a second pulse signal representative of full disk rotations;

(e) first counter means, incremented by said first pulse signal and reset by said second pulse signal, for developing a first count;

(f) second counter means incremented by select pulses of said second pulse signal, for developing a second count; and

(g) comparator means, responsive to said first and second counter means, for energizing said projection system to illuminate a given number of next occurring images in said zone, after said first count equals said second count.

4,297,010

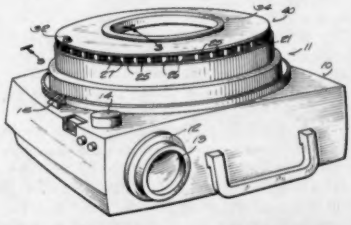
SLIDE TRAY PROTECTOR

Robert P. Koehler, 653 O'Dell St., Madison, Wis. 53711

Filed Dec. 31, 1979, Ser. No. 108,780

Int. Cl.³ G03B *23/06, 21/14*

U.S. Cl. 353—122 **6 Claims**



1. A dirt excluding cover for use with a slide tray that cooperates with a projector which has a cooling air propelling fan in it, the slide tray comprising a generally cylindrical body, a plurality of axially and radially extending circularly arranged spaced apart separator walls on the body defining slide receiving slots in the tray, a locking member having a cylindrical portion selectively engageable and disengageable with said body concentrically with said circular arranged partition walls, said locking member having a radially outwardly ex-

tending flange for overhanging radially inward portions of said partition walls to retain slides in the slots of said tray, said cover comprising:

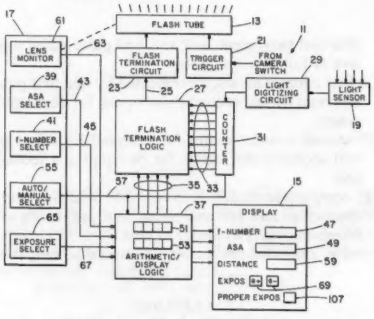
a disk composed of non-metallic material having a radial dimension from its center to its outer circular edge substantially equal to the radial extent of said partition walls for said disk to overlay the slots in the tray, said disk having a central opening through which said cylindrical portion of said locking member passes to enable it to engage said tray and to dispose said flange of the locking member over a radially extending portion of said disk to thereby retain said disk superimposed over said slots,

said disk material being selected from a class of materials consisting of paper and synthetic resin and the disk being sufficiently thin for it to fit loosely between said flange on the locking member and the separator walls and for it to flex slightly to increase the size of the hot air discharge path between said disk and said slots when said disk is locked by said locking member and said projector is operating.

4,297,011
PHOTOFLASH DEVICE

James R. Adams, Jr., Littleton, Colo., assignor to Rollei of America, Inc., Littleton, Colo.

Filed May 10, 1979, Ser. No. 37,814
Int. Cl.³ G03B 7/16
U.S. Cl. 354—23 D **45 Claims**



1. In a photoflash system having a flash device and means for firing the latter to produce light on a subject to be photographed, a display apparatus for visually displaying, prior to flash of the flash device, a maximum distance value representative of the maximum distance from the subject at which a subsequent flash will properly expose the film of an associated camera, comprising:

memory means having a plurality of memory address locations, each of which storing distance display signals representative of a maximum distance value, said memory means being responsive to memory address signals for outputting distance display signals;

ASA input means manually actuable by the photographer for inputting ASA data representative of one of a plurality of ASA film speeds, each of the film speeds representable being a power of two multiple of an ASA film speed, said input means commanding generation of first binary signals representative of the power of two change in ASA of the represented ASA input from an initiated ASA film speed value;

f-number means manually actuable by the photographer for inputting f-number date representative of a camera f-number, said f-number input means commanding generation of second binary signals representative of a change in f-stop positions of the represented f-number input from an initialized f-number value;

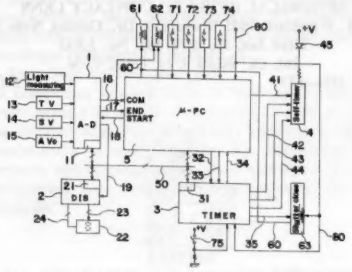
arithmetic means for receiving inputs of said first and said second binary signals, and generating memory address signals for addressing a memory address location in said memory means for commanding output of distance display signals from said memory means, said address location being dependent on the relative change of both the represented ASA and f-number from their respective said initialized values; and

display means responsive to said distance display signals output from said memory means for displaying a maximum distance value representative of the maximum distance at which a subsequent flash will properly expose film of an ASA speed inputted by said ASA input means, of an associated camera set at an f-number inputted by said f-number input means.

4,297,012
EXPOSURE CONTROL ARRANGEMENT FOR PHOTOGRAPHIC CAMERAS

Masaaki Nakai, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 7, 1979, Ser. No. 101,252
Claims priority, application Japan, Dec. 13, 1978, 53-154841; Dec. 25, 1978, 53-163800
Int. Cl.³ G03B 7/097
U.S. Cl. 354—23 D **8 Claims**



1. Digital exposure control arrangement for cameras comprising:

means for measuring light intensity and for generating an analog light measuring signal;

an A-D converter, operatively connected to said light intensity measuring means, for converting said analog light measuring signal into a digital light measuring signal;

means for setting exposure information and for producing exposure information signals;

a microprocessor for controlling camera operation, said microprocessor processing said digital light measuring signal and said exposure information signals to generate a diaphragm aperture control signal;

a diaphragm aperture capable of changing its aperture size;

means for generating a changing signal which changes in accordance with the changes in the aperture size of said diaphragm aperture;

means for comparing said changing signal with said diaphragm aperture control signal to generate a detecting signal when said changing signal has a predetermined relationship with said diaphragm aperture control signal, said comparing means being connected to said microprocessor for transmitting said detecting signal thereto, wherein said microprocessor advances into a next step of camera control upon receipt of said detecting signal; and

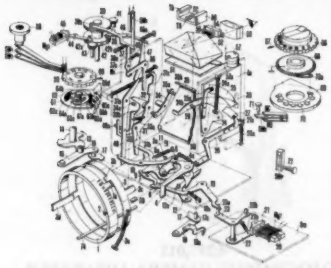
means directly connected with said comparing means for interrupting said change in aperture size of said diaphragm aperture upon receiving said detecting signal from said comparing means.

4,297,013

COORDINATING CONTROL SYSTEM FOR CAMERA

Masaharu Kawamura, Kawasaki; Masanori Uchidoi, Yokohama; Yoshihiro Shigeta, Tokyo; Yoji Sugiura, and Hiroshi Yamamoto, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1980, Ser. No. 116,314
Claims priority, application Japan, Jan. 31, 1979, 54-10195; Jan. 31, 1979, 54-10196; Jan. 31, 1979, 54-10197
Int. Cl.[3] G03B 7/093, 9/62, 17/38
U.S. Cl. 354—23 D 3 Claims



1. A camera having changeover positions for automatic exposure and bulb exposure modes including:

(a) a count switch for the automatic exposure mode arranged to be opened when the shutter is opened;

(b) a bulb switch arranged to be closed when set to the bulb exposure mode, said switch being manually operated;

(c) signal forming means for producing a detection signal when said count switch and said bulb switch are both opened;

(d) a timer for producing a signal after a predetermined time from the initiation of an actuation of release; and

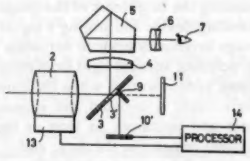
(e) changeover means for selecting the automatic exposure mode and bulb exposure mode, said means rendering the automatic exposure mode effective when the detection signal is applied from said signal forming means until elapse of a predetermined time from the initiation of the release actuation, and rendering the bulb mode effective when the detection signal from the signal forming means is not applied but instead when the signal from the timer is applied.

4,297,014

CAMERA FOCUS DETECTING DEVICE

Kazuo Nakamura, Shiki; Masao Jyojiki, Tsurugashima, and Harumi Aoki, Kiyose, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 117,921
Claims priority, application Japan, Feb. 14, 1979, 54-15904
Int. Cl.[3] G03B 3/10, 13/18
U.S. Cl. 354—25 9 Claims



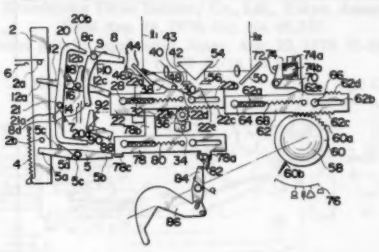
6. An automatic focus detecting device comprising: a self-scanning type photoelectric conversion element array; brightness detecting means; focus detecting means; switch means for coupling outputs of photodiode elements of said array in parallel and to said brightness detecting means for a brightness detection operation and alternately in serial fashion to said focus detecting means; and means for varying a scanning frequency of said array in response to an output of said brightness detecting means.

4,297,015

CAMERA AUTOMATIC FOCUS APPARATUS

Toshiaki Matsumoto, Izumisano, and Keisuke Maeda, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1980, Ser. No. 127,044
Claims priority, application Japan, Mar. 5, 1979, 54-25840
Int. Cl.[3] G03B 7/083, 3/10
U.S. Cl. 354—25 5 Claims



1. Automatic focus mechanism for a camera enabling sequential automatic focus adjustment and exposure operation in response to a shutter release operation, and automatic focus memory adjustment independently of exposure operation at any time prior to shutter release operation, comprising:

a shutter;

a release member movable by shutter release operation;

a range finding means;

a movable member movable from an initial position to a terminal position for operating said range finding means;

a focus memory operating member movable between a neutral position for normal photography and an operative position for focus memory photography;

a locking member adapted to lock said movable member at said initial position and operatively connected to said release member and said focus memory operating member for releasing said movable member either with said release member moved by a given first stroke or with said focus memory operating member moved to said operative position;

an objective;

an objective setting member for setting said objective and biased to follow said movable member upon movement thereof from said initial position to said terminal position;

arresting means connected to said range finding means for arresting said objective setting member to set said objective at an optimum focus with respect to an object being viewed by said range finding means;

a shutter actuating member biased to follow said movable member for actuation of said shutter with movement of said movable member from said initial position to said terminal position;

a first arresting member for preventing said shutter actuating member from following said movable member, and also adapted to be engaged by said movable member prior to the terminal position thereof being reached to enable said shutter actuating member to follow said movable member; and

a second arresting member for preventing said shutter actuating member from following said movable member upon the movement thereof from said initial position to said terminal position, and also adapted to be engaged by said

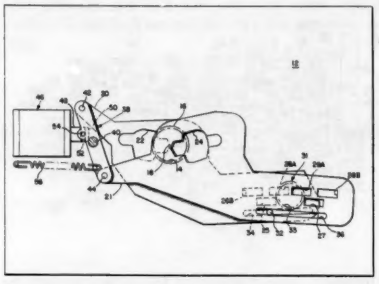
release member when said release member is moved by a given second stroke shorter than said first stroke to enable said shutter actuating member to follow said movable member.

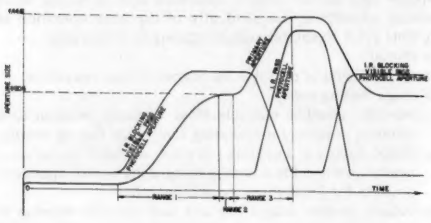
4,297,016

SCANNING SHUTTER BLADE ARRANGEMENT WITH DYNAMIC APERTURES FOR AMBIENT AND FLASH EXPOSURES

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 7, 1980, Ser. No. 166,970
Int. Cl.[3] G03B *7/08*
U.S. Cl. 354—27 **14 Claims**





1. A photographic camera apparatus of the type for use with a source of artificial illumination in either a predominantly ambient scene lighted mode or in a predominantly artificial scene lighted mode and which includes means for mounting photographic film material at a given film plane comprises:

a blade mechanism;

means for mounting said blade mechanism for displacement along a predetermined path to define a range of differently sized apertures;

means for providing a flash fire signal to ignite the source of artificial illumination at a time subsequent to the commencement of an exposure interval; and

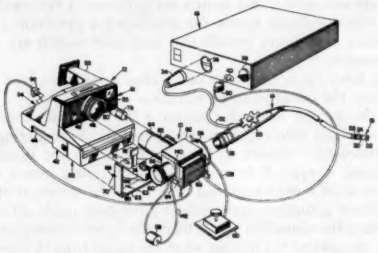
drive means for displacing said blade mechanism along said predetermined path to define the exposure interval, said blade mechanism and said drive means being cooperatively structured and arranged with respect to each other such that, for the predominantly ambient scene lighted exposures where the ambient scene light is above a select level, said drive means first displaces said blade mechanism from a first closed arrangement wherein it precludes scene light from reaching the film plane toward a second arrangement defining a maximum size aperture in said range of apertures and then displaces said blade mechanism back toward its said first closed arrangement prior to said blade mechanism being displaced beyond a third intermediate arrangement wherein it defines an aperture size substantially less than said maximum aperture size, and such that for the predominantly artificial scene lighted exposures said drive means first displaces said blade mechanism from its said first arrangement to its said second arrangement at said flash fire signal time and then displaces said blade mechanism back to its said closed arrangement wherein the rate at which said aperture sizes increase immediately prior to said blade mechanism being displaced into its said third arrangement from its said first arrangement is substantially less than the rate at which said aperture sizes increase immediately subsequent to said blade mechanism being displaced away from its said third arrangement toward its said second arrangement.

4,297,017

PHOTOGRAPHIC CAMERA APPARATUS

Zane M. Farmer, Ashburnham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 2, 1979, Ser. No. 63,043
Int. Cl.[3] G03B *7/089, 15/05, 29/00*
U.S. Cl. 354—34 **11 Claims**



1. Photographic apparatus for adapting an exposure control system of a self-contained automatic camera for use in photographing an image formed by an optical viewing device with which the camera is mechanically and optically coupled wherein the camera automatic exposure control system is of the type which upon camera actuation begins a photographic cycle during which film exposure commences upon the opening of a shutter and thereafter is terminated by a light sensing system which measures scene brightness and commands the shutter to close upon detection of a predetermined exposure value related to scene brightness and film speed, said apparatus comprising:

means for sensing the brightness of the image formed by the optical viewing device and storing a signal corresponding to the image brightness prior to actuation of the camera;

means for precluding ambient light from entering the camera light sensing system so that when the camera is actuated its exposure cycle is initiated and exposure of the film commences and continues so long as the camera light sensing system remains in the dark; and

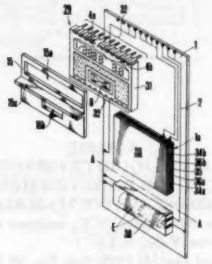
means responsive for sensing said brightness related signal and for providing an exposure parameter related signal and a high intensity light pulse within said light precluding means to cause the camera light sensing system to terminate exposure such that the exposure delivered to the film is appropriate for the film speed and image brightness.

4,297,018

PRINTED CIRCUIT UNIT FOR A CAMERA

Hiroyashu Murakami, Tokyo; Tadashi Ito, and Fumio Ito, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,645, Jun. 30, 1978, abandoned, which is a continuation of Ser. No. 746,297, Dec. 1, 1976, Pat. No. 4,134,654. This application Jul. 9, 1979, Ser. No. 55,964
Claims priority, application Japan, Dec. 2, 1975, 50-144159
Int. Cl.[3] G03B *7/08, 9/56, 17/20*
U.S. Cl. 354—50 12 Claims



1. For a camera which is provided with: P1 a photo-taking lens system,

veiw finder optical means, and

aperture frame means to define a photographing picture frame,

a printed circuit unit comprising:

(A) photo-sensing means to measure the brightness of an object to be photographed by said camera, means to produce an electric signal as corresponding to the object brightness,

(B) exposure operation circuit means to determine a proper exposure value based on the output signal of said photo-sensing means, and to produce an electric signal corresponding to a proper exposure value,

(C) display means to electro-optically display the proper exposure value information based on the output signal from said exposure operation circuit means,

(D) electrically insulating flexible circuit supporting means; said supporting means being adapted to be bent into a configuration to fit in a desired space within said camera and having an opening with a size at least equal to the size of the photographing picture frame defined by said aperture frame means,

(E) electrically conductive means being carried on said flexible supporting means,

said photo-sensing means, said exposure operation circuit means and said display means being carried on said flexible supporting means, and said photo-sensing means and said display means being electrically connected to said exposure operation circuit means through said electrically conductive means, and

said supporting means being constructed so that:

said photo-sensing means is placed at a position to receive a light beam from said object through at least a part of said view finder optical means,

said display means is placed at a position having the display information light beam display said proper exposure value information and impin;,e into at least a part of said view finder optical means, and

said opening of the supporting means matches with said photographing picture frame defined by said aperture frame means, and is mounted in a camera so at least to utilize a restricted space near said aperture frame means,

electric shutter means of the physico-optical type mounted on said flexible supporting means for covering said opening in said supporting means, and

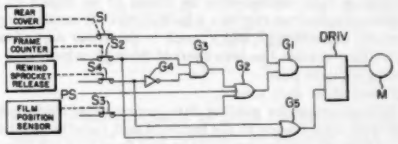
shutter control circuit means to control said shutter means on the basis of the output signal from said exposure operation circuit means; said control circuit means being mounted on said flexible supporting means and being electrically connected to said shutter means and said exposure operation circuit means.

4,297,019

AUTOMATIC FILM FEEDING APPARATUS FOR PHOTOGRAPHIC CAMERA

Michio Yagi; Kunio Nakajima; Yasutsugu Nakagawa; Sizuo Ishii, and Kazuhisa Aratame, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,337
Claims priority, application Japan, Aug. 22, 1978, 53-102104
Int. Cl.[3] G03B *17/36, 19/04*
U.S. Cl. 354—171 2 Claims



1. An automatic film feeding apparatus for a photographic camera which utilizes a film strip and which includes a motor drive mechanism for winding the film strip to photographic exposure enabling frame positions therealong, a counter operable for indicating the frame positions of the film strip, and a rear cover of the camera movable between an open position for film loading and removal and a closed position for photographic exposure of the film, said film feeding apparatus comprising:

a first switch operable in response to the position of the rear cover of the camera and switchable between a first state when the rear cover is closed and a second state when the rear cover is open;

a second switch operable in response to the position of the film counter and switchable between a first state until the counter indicates movement of the film strip to a first photographic exposure frame position and a second state when the counter indicates movement of the film strip to at least said first exposure frame position;

a third switch operable in accordance with the position of the film strip and switchable between a first state when the film strip is at a photographic exposure frame position and a second state when the film strip is remote from an exposure frame position; and

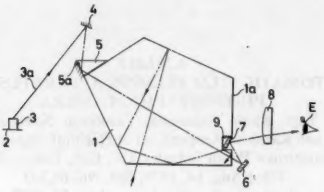
electronic control circuit means for operating the motor drive mechanism in response to the states of said first, second and third switches, said circuit means being adapted to operate the motor drive mechanism when said first and second switches are switched to said first states thereof and independently of the state of said third switch so as to automatically wind and feed the film strip substantially to said first photographic exposure frame on loading of the film strip into the camera and movement of the rear cover to its closed position, and said control circuit being further adapted to operate the motor drive mechanism when said first switch is in its first state and said third switch is in its second state and independently of the state of said second switch so as to wind the film strip to the next exposure frame position after photographic exposure at the preceding frame position.

4,297,020

VIEW FINDER FOR SINGLE-LENS REFLEX CAMERA

Yasuyuki Yamada, Tokyo, and Youichi Okuno, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1980, Ser. No. 118,799
Claims priority, application Japan, Feb. 7, 1979, 54-12992
Int. Cl.³ G03B *13/08, 17/20*
U.S. Cl. 354—225 **5 Claims**



1. A viewfinder for a single-lens reflex camera, comprising:

a viewfinder prism having an entrance face for receiving imaging light representing an image of an object to be photographed, an exit face which allows the incident light to exit therethrough and a notch in the lower part of said exit face outside the area thereof through which rays of imaging light pass;

a photographic data source;

an optical system for guiding data coming from said photographic data source to the inside of said viewfinder prism and then allows the data light to pass from said exit face of the viewfinder prism;

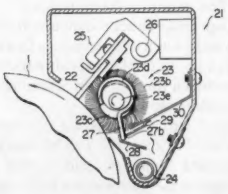
a reflection arrangement at least partly disposed in said ghost cut groove, said reflection body being arranged to direct the data light coming from said photographic data source and allowed to pass from said exit face towards an eyepiece.

4,297,021

POWDER MATERIAL TRANSPORTATION APPARATUS

Tatsuo Tani, Tokyo; Yasumori Nagahara, Yokosuka; Sakae Ohta, Tokyo; Minoru Suzuki, Yokohama, and Kiyozo Hashizume, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 6, 1979, Ser. No. 45,964
Claims priority, application Japan, Jun. 9, 1978, 53-69431; Jun. 9, 1978, 53-69432
Int. Cl.³ G03G *15/00;* **G01F** *11/20*
U.S. Cl. 355—3 R **11 Claims**



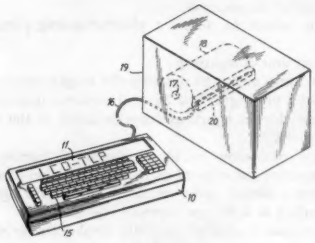
1. Apparatus for handling powdered material, said apparatus comprising: a housing comprising an upper portion and a bottom portion to receive the powdered material; a rotating member located in the bottom portion of the housing to transport the powdered material; a shaft in the housing to support the member rotatably, the member extending axially relative to the shaft; stirring means movably mounted in the housing between the upper portion of the housing and the rotating member to direct the powdered material to the rotating member; the rotating member comprising a helical structure; a second helical structure located to receive the powdered material from the first-named helical structure and convey the received powdered material in a direction at an angle to the direction the powdered material is conveyed by the first-named helical structure; electrophotographic means for electrophotographic reproduction; the powdered material comprising toner; and means to effect separate rotation of the first-named and second helical structures and to rotate both of the helical structures at a first speed during formation of electrophotographic reproductions and to continue to rotate the second helical structure at a speed less than the first speed for a predetermined period of time after formation of an electrophotographic reproduction.

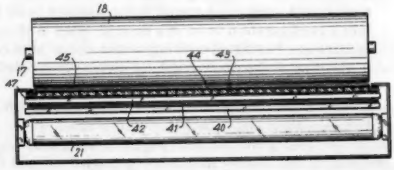
4,297,022

LIGHT PIPE VALVE LIQUID CRYSTAL TRANSMISSIVE DISPLAY FOR DIRECT IMAGING ON PHOTOSENSITIVE MATERIALS

Robert W. Lester, Manhasset, N.Y., assignor to Static Systems Corporation, New York, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,685
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **21 Claims**





14. A method for producing a liquid crystal display, the steps comprising:

applying a transparent conductive coating to the inner surface to a transparent, non-conductive, first sheet and to a substantially opaque, non-conductive second sheet, the latter of which has a plurality of discrete transparent channels formed therethrough, said coating being applied to said second sheet so as to separate said coating into discrete character forming segments, each of which overlie one of said transparent channels;

securing to said coatings on each of said sheets, means for electrically coupling said coatings to an external power source;

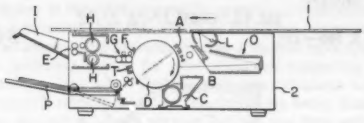
sealing a normally transparent liquid crystal material between said inner surfaces of said non-conductive sheets; and

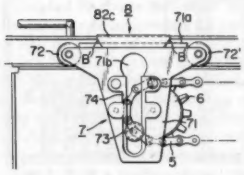
securing a linear polarizer sheet to the outer surface of each of said non-conductive sheets.

4,297,023
ELECTROPHOTOGRAPHIC COPYING APPARATUS

Mitsuru Nagoshi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1979, Ser. No. 61,053
Claims priority, application Japan, Jul. 31, 1978, 53-93449
Int. Cl.³ G03G *15/28;* G03B *27/62*
U.S. Cl. 355—8 **4 Claims**





1. In an electrophotographic copying apparatus including a machine body and a copy board movable thereon along a path,

suspension means on the machine body and comprising a pair of predeterminately spaced apart elements disposed along the path of the copy board, at least one of said elements being driven during operation of the copying apparatus,

an endless power transmitting means suspended between said spaced apart elements of the suspension means for driven movement of the power transmitting means during operation of the copying apparatus,

intermediator means including a closed vertical slot,

engaging means on said power transmitting means for non-releasable engagement in and movement along the vertical slot of said intermediator means such that driven movement of said power transmitting means causes said intermediator means to be carried by said engaging means reciprocatingly between said spaced apart elements of said suspension means, and

coupling means between said intermediator means and the copy board for releasable coupled engagement therebetween so as to normally couple said intermediator means and the copy board for reciprocating movement of the copy board along the path when said suspension means is driven during operation of the copying apparatus.

4,297,024
EXPOSURE DEVICE OF AN ELECTROGRAPHIC COPYING APPARATUS

Kiyohito Ebisawa, Tokyo; Satoshi Hisabayashi, Hachioji; Toshio Koike, Hachioji, and Kazuyuki Hashimoto, Hachioji, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1979, Ser. No. 32,345
Claims priority, application Japan, Apr. 25, 1978, 53-54166[U]; Apr. 25, 1978, 53-54167[U]; Apr. 25, 1978, 53-54168[U]
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 E **4 Claims**

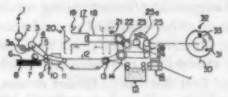
1. An exposure device of an electrographic copying apparatus which comprises at least one heat generative exposure lamp for creating an electrostatic latent image on a photosensitive paper corresponding to an original to be copied, wherein the device comprises:

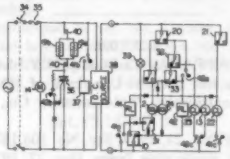
paper detector means for detecting said photosensitive paper when it is fed from a paper case to a paper feed device;

an exposure device disposed above said paper feed device and reciprocally movable with said exposure lamp;

exposure device detector means for detecting said exposure device at its start position;

cam means which is rotated by a drive means through a clutch means when said paper detector means detects the rear end of said paper, said cam means comprising a first





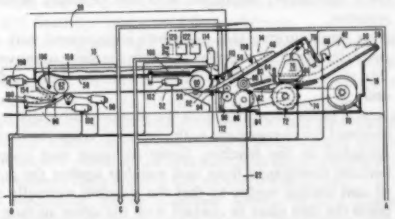
switch which represents an initial condition, second and third switches which represent an exposure start condition; and

exposure lamp control means comprising a relay means which is self-latched when said paper detector means and said exposure device detector means are turned off, and when said second and third switches are turned off and said relay remains latched until said exposure device detector means detects the start position, said exposure lamp being turned on during the time said relay means is operated.

4,297,025
DOCUMENT FEEDER SYSTEM HAVING A SUSPENDING/COMMENCING MODE

Paul S. Bach, Boulder, Colo.; Steven R. Harding, Idaho Falls, Id.; Richard A. Lamos, Boulder, Colo.; Harvey R. Markham, Westminster, Colo., and Roger D. Shepherd, Nederland, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,679
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **8 Claims**



1. In a document reproduction system including a document feeder system, an electrophotographic copier system and a copy exit system, configured to suspend processing a prior task, commence processing a subsequent task and then, re-commence processing said prior task, the improvement comprising:

means for entering a suspending/commencing mode;

first document feeder means of said document feeder system

for feeding original documents to a document viewing glass of said electrophotographic copier system for copying thereof;

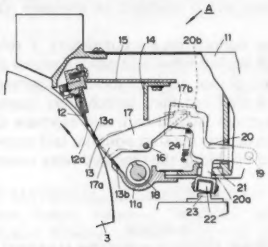
second document feeder means of said document feeder system for feeding original documents to a document viewing glass of said electrophotographic copier system for copying thereof; and

logic control means operatively connected and responsive to said means for entering said suspending/commencing mode, and operatively connected to said first document feeder means, said second document feeder means and said electrophotographic copier system for immediately entering said suspending/commencing mode, for suspending operation of either said first or said second document feeder means processing said prior task, and in turn, for immediately thereafter commencing operation of said second or said first document feeder means, respectively, processing said subsequent task, and upon the completion thereof, for immediately re-commencing said prior task.

4,297,026
CLEANING APPARATUS FOR COPY MACHINES

Hiroyuki Honda, and Hiroaki Ura, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 106,157
Claims priority, application Japan, Dec. 27, 1978, 53-160001
Int. Cl.³ G03G *21/10*
U.S. Cl. 355—15 **2 Claims**



1. In a cleaning apparatus for a copying machine including a photosensitive drum detachably mounted on the machine frame, cleaning means for scraping toner from the drum surface, and a thin plate normally applied to the drum surface for guiding toner scraped therefrom by the cleaning means into a toner recovery box, the improvement comprising:

a pivotally mounted member normally supporting the thin plate in engagement with the drum surface;

a lever operatively engagable with said pivotally mounted member;

biasing means urging said lever into engagement with said pivotally mounted member to rotate the same to move the thin plate to a position withdrawn from the drum surface; and

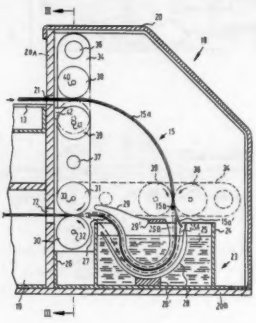
an action piece associated with the photosensitive drum and disposed for engagement with said lever when the drum is mounted on the machine frame to cause said lever to become disengaged from said member against the action of said biasing means so that the member normally supports the thin plate in contact with the drum surface;

whereby detachment of the drum from the machine frame causes said action piece to disengage said lever which there upon moves into engagement with said member under the action of said biasing means to move the thin plate to a position withdrawn from the drum surface and thereby prevent damage to the thin plate or to the drum surface as the drum is detached from or reattached to the machine frame.

4,297,027
APPARATUS FOR EXPOSING AND DEVELOPING PHOTOSENSITIVE MATERIAL

Otto Stemme, Munich; Berthold Fergg; Viktor Osegowitsch, both of Taufkirchen, and Wolfgang Viehrig, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 27, 1979, Ser. No. 97,720
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851893
Int. Cl.³ G03B *27/32, 27/52*
U.S. Cl. 355—27 **20 Claims**

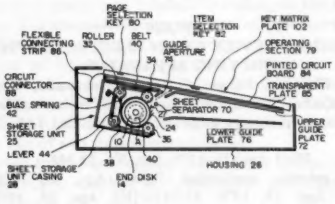


1. Apparatus for exposing and developing film units wherein two sheets overlap each other, comprising an exposing unit including means for supporting successive film units in a predetermined plane during exposure of such units to light; and a developing unit including advancing means, a carriage mounting at least a portion of said advancing means and including a lever, means for pivoting said lever about a predetermined axis between a first position in which said advancing means can engage a film unit located in said plane and a second position in which the thus engaged film unit is at least partially withdrawn from said plane, and a vessel containing a supply of liquid developing agent and being adjacent to said portion of said advancing means in said second position of said lever, said portion of said advancing means comprising two parallel rolls rotatably mounted on said lever.

4,297,028
MULTI-ITEM DATA INPUT APPARATUS

Yashiro Seki; Hideo Kobayashi; Kiyoshi Kimura, and Masayuki Naito, all of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 141,182
Claims priority, application Japan, Jun. 21, 1979, 54-78295
Int. Cl.³ G03B *27/52, 23/02*
U.S. Cl. 355—41 **17 Claims**



1. A multi-item data input apparatus for manually actuated generation of data to specify selected ones of a plurality of items, comprising:

a housing;

a sheet holder of substantially cylindrical configuration rotatably mounted in said housing;

a plurality of flexible sheets each having a page of data appearing thereon in visible form, each of said pages comprising a plurality of said items, each of said flexible sheets being attached at one end thereof to said sheet holder, said flexible sheets being axially rolled around said sheet holder such as to successively overlap at equidistant angular intervals;

keyboard means including a plurality of page selection keys coupled to switching means for generating corresponding page selection data when each of said page selection keys is actuated and a plurality of item selection keys coupled to switching means for generating corresponding item selection data when each of said item selections keys is actuated, each of said item selection keys being transparent through at least a portion thereof, said item selection keys being arranged in positions corresponding to positions of said items on each of said pages;

guide means disposed adjacent to said sheet holder; and

drive means coupled to rotate said sheet holder, being responsive to said page selection data for rotating said sheet holder in a first direction of rotation which is opposite to a direction in which said flexible sheets are rolled on said sheet holder, said rotation being continued until a selected one of said flexible sheets corresponding to a page designated by said page selection data is positioned adjacent to said guide means, said drive means then rotating said sheet holder in a second direction of rotation opposite to said first direction through a predetermined angular displacement, whereby said selected flexible sheet is directed by said guide means to be positioned in a substantially flat condition below said item selection keys, such that said items on the selected flexible sheet are visible through corresponding ones of said item selection keys.

4,297,029

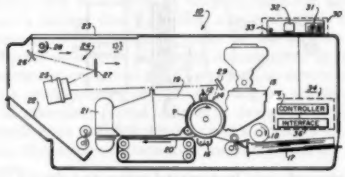
APPARATUS AND METHOD FOR DIAGNOSTIC ENTRY

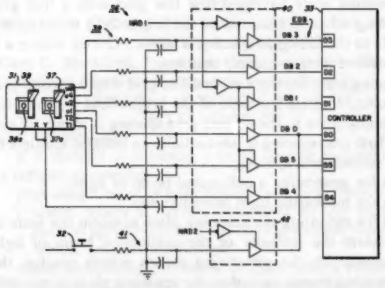
Gerald E. Carlson, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1979, Ser. No. 28,636

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—133 **6 Claims**





2. In an electrostatic printing apparatus having a plurality of processing stations and an operator's console provided with a plurality of machine instruction devices, the electrostatic printing apparatus adapted for operating in a first state for reproducing a predetermined number of copies of an original and adapted for operation in a second state for diagnosing operation of selected processing stations, the method of placing the electrostatic printing apparatus in the second state comprising the steps of:

initiating a malfunction condition,

activating one of the plurality of instruction devices,

again activating one of the plurality of instruction devices, whereby the apparatus is placed in the second state.

4,297,030

METHOD AND APPARATUS FOR MEASURING THE DISTANCE AND/OR RELATIVE ELEVATION BETWEEN TWO POINTS

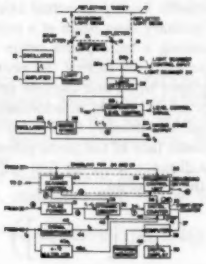
Hoiko Chaborski, Ottobrunn, Fed. Rep. of Germany, assignor to MITEC-Moderne-Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 926,099, Jul. 19, 1978, abandoned, which is a continuation of Ser. No. 743,801, Nov. 22, 1976, abandoned. This application May 31, 1979, Ser. No. 44,344

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553591

Int. Cl.³ G01C *3/08*

U.S. Cl. 356—5 **8 Claims**



1. A method for opto-electronically measuring the distance between a measuring point and a reflecting target, comprising the following steps: pg,22

(a) producing a fixed frequency signal having a given fixed frequency,

(b) modulating the light of a light source with said fixed frequency signal to produce a modulated light beam,

(c) dividing the modulated light beam into a reference light beam and into a measuring light beam, both beams having said fixed frequency modulated thereon,

(d) processing, during a first portion of a complete measuring sequence, said reference light beam through receiver means for producing a first electrical signal representing the reference phase of said reference light beam,

(e) repeatedly producing, in response to said first electrical signal a time raster signal which is phase locked with said reference phase of the first electrical signal even after the reference light beam is not received any more,

(f) processing, during a second portion of said complete measuring sequence, said measuring light beam after reflection from said target through said receiver means, which are the same receiver means which processed said reference light beam in the first portion of the measuring sequence, for producing a second electrical signal representing the phase shift of said reflected, measuring light beam relative to said reference phase, said phase shift representing the distance to be measured, and

(g) measuring in said second portion of said complete measuring sequence said phase shift of said reflected, measuring light beam, whereby said phase shift measuring begins in response to said time raster signal and is terminated in response to said phase shifted second electrical signal.

4,297,031

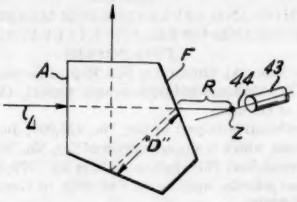
APPARATUS AND PROCESS FOR SWEEPING A FLAT OPTICAL LIGHT PLANE

Martin R. Hamar, 70 Linden Tree Rd., Wilton, Conn. 06897

Filed Sep. 26, 1979, Ser. No. 78,933

Int. Cl.[3] **G07B** *11/26;* **G02B** *7/18*

U.S. Cl. 356—247 **6 Claims**



1. A process for sweeping a flat optical light plane perpendicular to a primary input laser beam emanating from a laser device comprising the steps of:

providing a spindle having its actual axis of rotation intersecting the primary laser beam at a point;

rotatably mounting a solid penta prism onto said spindle such that the entrance face of the penta prism intersects the primary laser beam and the first reflecting surface of the penta prism is located intermediate the laser device and said point, said primary laser beam centrally intersecting the entrance face of the penta prism, said point being located at a distance from the first reflecting surface according to the following,

$$R = D\left(1.024 - 3.414\left[1 - \frac{1}{N'}\right]\right)$$

where D is the distance that the beam traverses within the penta prism between the first reflecting surface and the second reflecting surface, and N′ is the index of refraction of the prism; and

rotating said penta prism about said spindle to sweep a flat optical light plane.

4,297,032

DARK FIELD SURFACE INSPECTION ILLUMINATION TECHNIQUE

Paul A. Temple, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1980, Ser. No. 121,625

Int. Cl.[3] **G01N** *21/21, 21/47, 21/88;* **G01J** *4/00*

U.S. Cl. 356—366 **17 Claims**

1. A surface inspection method for finding defects contained in or on an optical sample comprising the steps of:

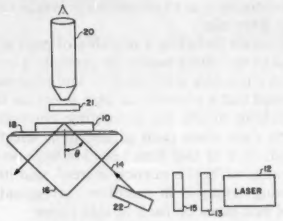
coating one side of a prism whose index of refraction is similar to said optical sample with an index matching fluid;

placing said optical sample on said fluid coated side;

establishing an observation point above said optical sample to view the surface at a normal angle;

directing a beam of monochromatic polarized light into said prism such that said beam reflects off of the upper surface of said optical sample at the critical angle beneath said observation point so as to create a standing wave pattern which scatters light off of imperfections smaller than the wavelength of said standing waves except when said imperfections are located at null points of said standing waves;

varying the standing wave pattern so that the null points of said standing waves occur at different depths within the optical sample, the imperfections appear and disappear as null points pass through it;



comparing the possible depths at which the imperfections appear for a plurality of different standing wave patterns to uniquely identify the depth in the sample of each imperfection; and

moving said optical sample so that all areas of said optical sample are viewed from said observation point to observe said scattered light which has been scattered toward said upper surface at less than the critical angle.

4,297,033

INCREMENTAL PHOTOELECTRIC MEASURING DEVICE

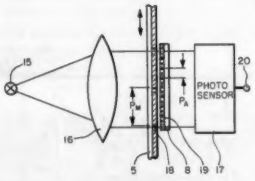
Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 45,295

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826213

Int. Cl.[3] **G01B** *11/14, 11/04*

U.S. Cl. 356—374 **2 Claims**



1. A photoelectric incremental measuring device comprising:

a measuring scale having a first line grid with a first grid spacing wherein the ratio of the bright-field width of the scale to the first grid spacing is about 1:(2×n), where n is a positive integer greater than one;

a scanning plate having a second line grid with a second grid spacing, wherein the ratio of the bright-field width of the scanning plate to the second grid spacing is about 1:2 and the first grid spacing is substantially an integral multiple of the second grid spacing;

means for generating a collimated beam of light;

means for measuring light intensity; and

means for mounting the scanning plate adjacent the scale to modulate the intensity of the collimated beam of light generated by the generating means which reaches the measuring means such that the scanning plate is movable substantially parallel to the scale and no focusing elements are mounted between the scale and the scanning plate.

4,297,034

APPARATUS FOR MEASURING CONTOUR CONFIGURATION OF ARTICLES

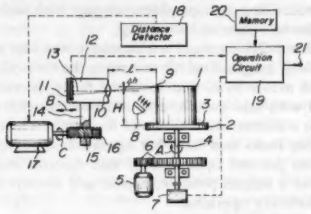
Isao Ito, Nagoya, and Seiichi Tunashima, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jun. 15, 1979, Ser. No. 48,735

Claims priority, application Japan, Sep. 11, 1978, 53-110599

Int. Cl.³ G01B *11/24, 11/00*

U.S. Cl. 356—394 **4 Claims**



1. An apparatus for measuring contour configuration of articles comprising;

a turn table on which the article to be measured is placed;

a detector for detecting a rotational angle of said turn table to produce a rotational angle signal;

a light source for illuminating at least a portion of the article on the turn table, the contour configuration of said portion being to be measured;

a pick-up device including a lens for forming an optical image of said portion of article to be measured and an image detector for receiving said image to produce a video signal;

a memory for storing a standard signal which corresponds to a standard article having given contour configuration;

an operation circuit for receiving said rotational angle signal, the video signal and the standard video signal and producing a signal which represents deviation in the contour configuration of the article to be measured from the standard article;

means for detecting a distance l between the portion of article to be measured and the pick-up device; and

means for driving the pick-up device in a direction of its optical axis in accordance with the detected distance in such a manner that the optical image of article is always focused on the image detector in the pick-up device, wherein an edge of the article is illuminated by said light source and an optical axis of said pick-up device is aligned on a corresponding edge of the standard article whereby said operation circuit detects a deviation of height of article from a standard height and a deviation of the contour dimension of article to be measured from the standard value.

4,297,035

METHOD AND DEVICE FOR DETECTING A SPECIFIC SPECTRAL FEATURE

Gary C. Bjorklund, Los Altos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1979, Ser. No. 75,436

Int. Cl.³ G01N *21/27*

U.S. Cl. 356—402 **10 Claims**

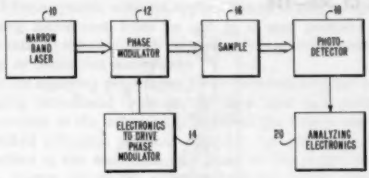
1. A method of detecting a single narrow spectral feature in a sample comprising

providing a beam of light having an optical frequency bandwidth which is narrow compared to the width of the narrow spectral feature and having a center frequency ω_C which lies near the feature;

phase modulating the beam of light with a single RF frequency to provide a pure FM spectrum having upper and lower sidebands;

exposing the sample containing the narrow spectral feature to the modulated light so that only one of the FM sidebands probes the narrow spectral feature;

photodetecting the light emerging from the sample to detect a beat at the specific RF frequency used for phase modulation; and



electronically monitoring the amplitude of the RF beat signal to indicate the strength of the narrow spectral feature.

4,297,036

EXTRUDER FOR PREPLASTICIZATION OF THERMOSET MOLDING MATERIALS

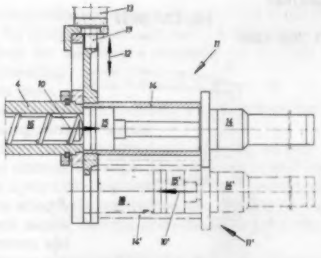
Klaus Schröder, Marienheide, Fed. Rep. of Germany, assignor to Firma C. & W. Berges Maschinenfabrik, Marienheide, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,787

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825349

Int. Cl.³ B29B *1/06, 5/04*

U.S. Cl. 366—77 **1 Claim**



1. In an extrusion machine for the preplasticization of thermosetting plastics including a rotating screw and a heated screw cylinder which compresses pulverulent material against a pressure head to impart plasticization, the improvement comprising:

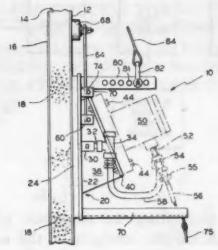
(a) a receiving cylinder positioned adjacent the discharge end and coaxial with the screw cylinder, said receiving cylinder having a hydraulic discharge piston which continually retracts when an adjustable pressure head has been exceeded; and

(b) a sliding pressure cylinder for moving said receiving cylinder at right angles to the direction of the longitudinal axis of said screw.

4,297,037
VACUUM ATTACHED VIBRATOR APPARATUS

David M. O'Meara, Joliet, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 8, 1980, Ser. No. 147,857
Int. Cl.[3] B01F *11/00*
U.S. Cl. 366—114 7 Claims



1. Apparatus for removable attachment to a rigid surface for vibrating the same comprising:

a vacuum plate having a face with an elastomeric gasket around the face periphery and contactable with said rigid surface;

a vibrator mount on the vacuum plate;

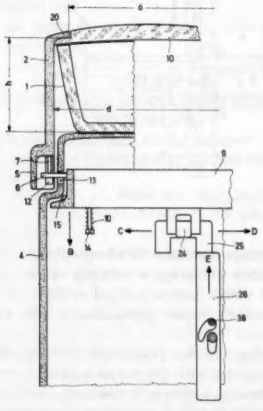
a vibrator joined to the vibrator mount; and

said elastomeric gasket projecting sufficiently forward from the vibrator mount and the vacuum plate to prevent the vibrator mount and the vacuum plate from touching the rigid surface when attached thereto so that all vibrations developed by the vibrator are transmitted to the rigid surface through the elastomeric gasket and the pressure waves in the vacuum plate.

4,297,038
ELECTRIC BLENDER

Guenther Falkenbach, Eschborn, Fed. Rep. of Germany, assignor to Braun AG, Kronberg, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 88,917
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817044
Int. Cl.[3] B01F *7/16*
U.S. Cl. 366—206 7 Claims



1. An electric household blender including a motor base having a housing, an electric operating switch mounted in said motor base to turn on an electric motor, and a removable container which can be mounted on said motor base, comprising:

(a) a container holder (2) adapted to be placed on said motor base;

(b) a lock ring (9) mounted and guided in said motor base and capable of rotating about the longitudinal axis of said motor base;

(c) lock bolts (8) arranged on said lock ring;

(d) lock bolt supports (12) arranged on said container holder;

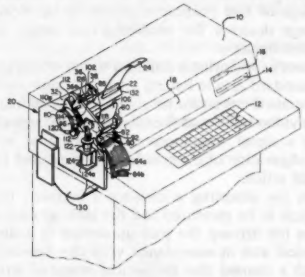
(e) a lock bar (11) arranged to extend through an opening in said motor base and operable to engage with said lock ring in order to rotate said lock ring;

(f) a lock rod (26) arranged within said motor base so as to be capable of longitudinal movement in the vertical direction of said motor base, said lock rod being operatively engaged with said switch, and cooperating with said lock ring in a manner such that said lock ring, when in a first position, locks said lock bar against longitudinal movement to prevent operation of said electric switch, and when in a second position, allows said electric switch to be selectively operated.

4,297,039
THERMAL PRINTER

Robert Lees, Newark, Del., assignor to Autotote, Ltd., Newark, Del.

Filed Dec. 29, 1978, Ser. No. 974,440
Int. Cl.[3] B41J *3/20*
U.S. Cl. 400—120 6 Claims



1. A document printer for printing documents on thermally sensitive paper and driving said paper through cut-off means to cut the paper to predetermined lengths comprising:

a frame having generally parallel spaced apart walls;

a drive motor on the frame having drive engaging means for driving said thermally sensitive paper;

actuator means on the frame for actuating the cut-off means;

a first sub-frame having generally parallel spaced apart walls parallel to the walls of the frame, which first sub-frame is pivotally supported on and within the frame walls by first pivot means generally perpendicular to the parallel walls and has an operational position;

a thermal printing element on a separate removable base supported on the first sub-frame by a pivot pin engaging portion open on one side which enables the base in alternate position of the first sub-frame to be lifted away from the first sub-frame and supported at the opposite end by means which rests against the first sub-frame on the side opposite from a friction drive roller means, the thermal printing element being supported in position to define a portion of a paper path and comprising at least a row of high resistance printing dots;

a second sub-frame having generally parallel spaced apart walls parallel to the walls of the frame, which second sub-frame is pivotally supported on the frame by second pivot means generally perpendicular to the parallel walls

and has an operational position adjacent and opposed to the operational position of the first sub-frame;

the friction drive roller means being rotatably supported on the second sub-frame opposite from the thermal printing element and positioned to drive the thermally sensitive paper along a path past the thermal printing element by contacting the paper on the side opposite from the thermal printing element, the friction drive roller means being positioned on the second sub-frame opposite the thermal printing element in such position as to urge through its inherent resiliency the paper to engage the thermal printing element so that the thermal printing element is effective to print on the paper and having drive coupling means positioned to engage the drive engaging means of the drive motor to move said thermally sensitive paper along the paper path past the thermal printing element when the second sub-frame is in operational position, the motor being supported on the frame, said drive coupling means comprising gear means and the gear means being rotatably supported on the second sub-frame so that the gear means are engaged on the second sub-frame in operational position and disengaged as the second sub-frame is moved from operational position;

the cut-off means being positioned on the second sub-frame to cut off the paper at selected lengths to include predetermined ticket information on the selected length and linkage means placed into actuating position with the actuator means when the second sub-frame is in operational position;

separate releasable means for normally maintaining each of the sub-frames in its operational position but permitting pivotal movement to at least an alternate position upon release of the releasable means, such that in the alternate positions the thermal printing element may be reached for cleaning; and

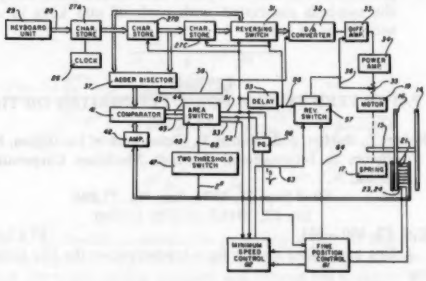
means to selectively heat individual dots to generate patterns on said thermally sensitive paper moved past the thermal printing element.

4,297,040

METHOD AND APPARATUS FOR POSITIONING A TYPE DISC IN A BALANCED FORCE SYSTEM

Diethelm Puch, and Norbert F. Will, both of Nuremberg, Fed. Rep. of Germany, assignors to Triumph-Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,117
Int. Cl.³ B41J *1/30, 23/14, 23/16*
U.S. Cl. 400—144.2 **10 Claims**



1. The method for positioning a type disc in a fixed cycle balanced force system, wherein applied forces to effect angular positioning movement from an old to a new position are brought into equilibrium with opposing spring forces without damping or overshoot, comprising the steps of

applying positioning forces to effect angular positioning movement from an old to a new position according to the natural oscillation of the system about a selected reference position, whereby the new position is reached at the maximum amplitude of the oscillation of the system about the reference position when angular velocity is zero, and

applying a force corresponding to the new position when the new position is reached to maintain the system at the new position.

4. Apparatus for positioning a type disc in a fixed cycle balanced force system, wherein applied forces to effect angular positioning movement from an old to a new position are brought into equilibrium with opposing spring forces without damping or overshoot comprising

means for applying positioning forces to effect angular positioning movement from an old to a new disc position according to the natural oscillation of the system about a selected reference position whereby the new position is reached at the maximum amplitude of the oscillation of the system about the reference position when angular velocity is zero,

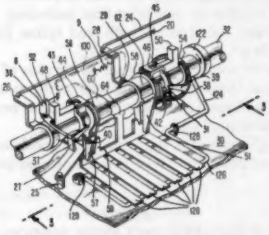
and means for applying a force corresponding to the new position when the new position is reached to maintain the system at the new position.

4,297,041

VARIABLE CAM PROFILE SELECTION SYSTEM FOR SINGLE ELEMENT TYPEWRITER

John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1979, Ser. No. 25,824
Int. Cl.³ B41J *1/32*
U.S. Cl. 400—161.4 **22 Claims**



1. A cam controlled selection apparatus, for a single element typewriter, for controlling at least one of two degrees of movement required for selecting a character on a single typing element, comprising:

a rotatable shaft,

a cam means mounted for rotating with said shaft and having a camming surface thereon;

cam follower means abutting said camming surface;

means for altering the angle of inclination of said camming surface upon axial displacement of said cam means;

means for selectively controlling the axial displacement of said cam means, thereby controlling the cam rise of said cam means; and

linkage means interposed between said cam follower means and said typing element for transmitting movement of said cam follower means to said typing element.

4,297,042

HELICAL PRINT HEAD MECHANISM

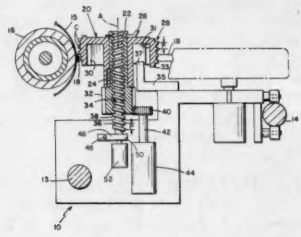
An Wang, Lincoln, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed May 29, 1980, Ser. No. 154,385
Int. Cl.³ B41J *1/40, 7/52*
U.S. Cl. 400—163.2 **4 Claims**

1. An impact printer head mechanism for serially printing a line of characters on a print medium comprising

a generally cylindrical print head having its axis generally perpendicular to said print line

said print head having
a matrix of characters formed on its exterior surface parallel to said axis in a multi-turn helical row of predetermined pitch
a screw thread of said predetermined pitch and coaxial with said axis, and
a spline coaxial with said axis and axially spaced from said matrix
print head supporting means for supporting said print head for rotational and axial movement relative to said print medium, said print head supporting means having
a rotatably fixed screw thread coaxial with said axis and of



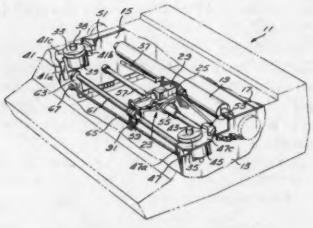
said predetermined pitch cooperating with said print head screw thread, and
print head drive means for simultaneously rotatably and axially moving said print head to position a desired character relative to said print line, including
gear means cooperating with said spline for rotating said print head,
the relative rotation of said screw threads of said print head and said supporting means producing simultaneous rotational and axial movement of said print head relatively to said print line, and
operating means for operating said mechanism to cause a selected character to be printed on said print medium.

4,297,043

IMPACT PRINTER INCLINED RIBBON SCANNER

Dayton O. Dargatz, Anaheim, Calif., assignor to Plessey Peripheral Systems, Irvine, Calif.

Filed Nov. 1, 1978, Ser. No. 956,737
Int. Cl.³ B41J *33/56*
U.S. Cl. 400—224 **8 Claims**



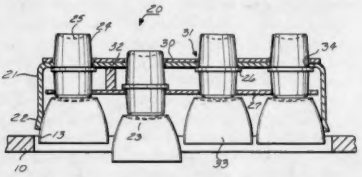
1. An impact printer comprising:
a frame;
guide means mounted on said frame, comprising: primary guide means; and secondary guide means obliquely disposed
with respect to said primary guide means;
a carriage supporting a print head, said carriage movably mounted on said guide means for reciprocation along a printing line;
a ribbon supported on said carriage; and
means in communication with said secondary guide means for adjusting the position of said ribbon relative to said print head so that said printing line is not parallel to the longitudinal axis of said ribbon.

4,297,044

ADDITIONAL ATTACHMENT FOR ALL TYPES OF KEY OPERATED MACHINES

Harald Hornberg, Berlin; Günter Trotzek, and Fedor Hahnefeld, both of Unterhaching, all of Fed. Rep. of Germany, assignors to H. Berthold Aktiengesellschaft, Fed. Rep. of Germany

Filed May 8, 1979, Ser. No. 37,045
Claims priority, application Fed. Rep. of Germany, May 8, 1978, 2820422
Int. Cl.³ B41J *5/08*
U.S. Cl. 400—473 **6 Claims**



1. Additional attachment for machines operated by a first set of keys disposed in a keyboard comprising:
a frame, said frame covering said keyboard;
said frame having the shape of a first plate, said first plate including a plurality of perforations, said perforations being aligned with said keys of said first set of keys in said keyboard, said first plate being a solid plate with side and edge areas, complementary to outer edges of said first set of keys, said side and edge areas abutting the outer edges of the rows of said first set of keys which form the boundaries of said keyboard, to vertically support the attachment solely by said abutment, said side and edge areas aligning said attachment with said first set of keys;
a second set of keys, said second set of keys being disposed in said perforations in said first plate;
and
a second plate disposed in a detachable manner on the surface of said first plate, said second plate including a plurality of perforations in agreement and conformity with said perforations in said first plate, said second plate carrying the symbols associated with each of said keys in said second set of keys.

4,297,045

PAPER FEED SYSTEM FOR A TYPEWRITER OR THE LIKE

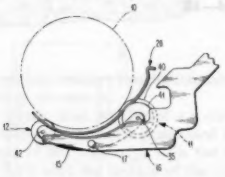
Robert L. Burton, and Thomas P. Finan, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1979, Ser. No. 77,884
Int. Cl.³ B41J *13/076, 13/048*
U.S. Cl. 400—641 **17 Claims**

1. In a paper feed system for a typewriter or the like including:
a rotatable platen;
rear feed roller means engageable with said platen when no paper is therebetween so as to be rotatable with said platen when said platen rotates;
and front feed roller means engageable with said platen when no paper is therebetween so as to be rotatable with said platen when said platen rotates;
the improvement comprising:
said rear feed roller means including a plurality of rear feed rollers engageable with said platen when no paper

is therebetween so as to be rotatable with said platen when said platen rotates;

each of said rear feed rollers including an annular outer portion formed of a material sufficiently compressible when a plurality of sheets of paper with adjacent sheets having different coefficients of friction is simultaneously disposed between said platen and said rear feed rollers to have a portion of each of said rear feed rollers not having paper between said rear feed roller and said platen remain in engagement with said platen for driving of each of said rear feed rollers during rotation of said platen while another portion of each of said rear feed rollers has the sheets of paper between said rear feed roller and said platen until the rotation of said rear feed rollers advances the sheets of paper completely



between each of said rear feed rollers and said platen, the material of each of said rear feed rollers having a sufficiently high coefficient of friction with the material of said platen for each of said rear feed rollers to be driven by said platen and a sufficiently high coefficient of friction with the sheets of paper for each of said rear feed rollers to advance the sheets of paper in conjunction with said platen, and the material of each of said rear feed rollers being sufficiently hard to avoid treeing;

said rear feed roller means including support means for each of said annular outer portions;

each of said annular outer portions having its width substantially less than its diameter;

and each of said annular outer portions having its thickness equal to or less than its width.

4,297,046

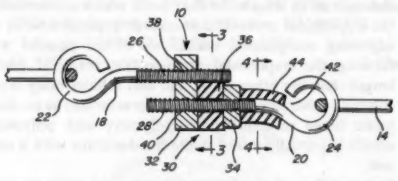
TURNBUCKLE

Roy F. McGill, 538 W. Popular St., Gastonia, N.C. 28052

Filed Jan. 29, 1980, Ser. No. 117,644

Int. Cl.³ F16B *7/06*; F16G *11/12*

U.S. Cl. 403—46 **7 Claims**



1. A turnbuckle construction including a pair of first and second opposite end generally parallel and oppositely threaded shank members having adjacent and remote ends, center nut means defining a pair of oppositely threaded generally parallel bores formed therethrough in which said adjacent ends are threadedly engaged, the remote ends of said first and second shank members including first and second anchor means, respectively, for anchoring relative to associated tension members, said first anchor means including an open throat hook formed on the end of said first shank remote from and opening toward said second shank and with which a closed ring type anchor member may be engaged, said first shank including a throat closing member mounted on said first shank for movement therealong toward and away from position closing and opening said throat, said throat closing member being engageable by said nut means, upon threaded movement of the latter on said first shank toward said throat, to move said throat closing member into position closing said throat to prevent disengagement of said anchor member from said hook, said nut means including a first nut member in which said pair of oppositely threaded bores are formed in side-by-side relation and a second nut member threaded on one of said shank members, and an axially compressible and radially expandable friction member having a friction bore formed therethrough and disposed on said one shank member between said nuts for adjustable axial compression therebetween and radial inward expansion into frictional engagement with the portion of said one shank passing through said friction bore.

4,297,047

BALL AND SOCKET JOINT

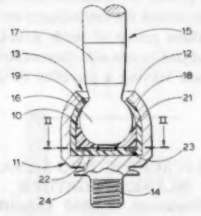
David J. R. Farrant, Radford Semele, England, assignor to Automotive Products Limited, Warwichshire, England

Filed Jun. 5, 1980, Ser. No. 156,801

Claims priority, application United Kingdom, Jun. 9, 1979, 20172/79

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—138 **5 Claims**



1. A ball and socket assembly for the steering and suspension system of a motor vehicle and comprising:

a socket housing having a cavity defined therein;

a ball pin, the head of which is located in the cavity and the shank of which extends through the mouth of said cavity;

a resilient cup shaped lining located in the cavity and the mouth of which provides a bearing surface for the head of the pin adjacent the mouth of the cavity; and

a resilient end cap located in the base of the cup shaped lining to provide a bearing surface for the head of the pin in the base of the cavity, said end cap having a face thereon that is opposed to a co-operating face of the cup shaped lining, said opposed faces being spaced apart by resilient projections held in compression by the assembly of the joint.

4,297,048

FASTENERS FOR JOINING ANGULARLY RELATED WOODEN MEMBERS

John C. Jureit, Coral Gables, and Henry R. Greenley, Fort Lauderdale, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

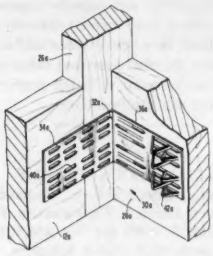
Continuation of Ser. No. 748,679, Dec. 8, 1976, abandoned. This application Mar. 23, 1979, Ser. No. 23,186

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—189 **15 Claims**

1. A fastener for joining angularly related wooden members comprising: a flat sheet metal plate bent to provide first and second planar plate portions lying in respective first and second planes intersecting one another and forming an included angle; said plate being further bent to provide a third planar plate portion lying in a third plane intersecting said first and

second planes; a first group of elongated nail-like teeth struck from said one plate portion to project to one side thereof for embedment into one of the members; and a second group of elongated teeth struck from said second plate portion to project to one side thereof and leaving a plurality of elongated slots in said second plate portion, the teeth of said second group having angularly related shank and tip portions with said shank portions extending from said second plate portion to



form an included angle therewith, said tip portion extending from said shank portions in a direction toward said second plate portion and poised for insertion through the slots from which the teeth are struck for embedment into the other of the members; and a third group of teeth struck from said third plate portion to project to one side thereof for embedment into a third member and leaving a plurality of slots in said third plate portion.

4,297,049

DEVICE FOR ATTACHING TWO METAL SHEETS OR BLANKS TOGETHER

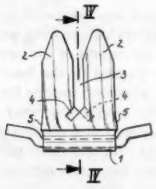
Günter Smitka, Friedenstr. 9, 5868 Letmathe, Fed. Rep. of Germany

Filed May 4, 1979, Ser. No. 36,049

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833801

Int. Cl.³ F16B *17/00*

U.S. Cl. 403—403 **2 Claims**



1. A device for fastening to each other two metal sheets or blanks arranged approximately perpendicular to each other by means of a fastening clamp which has a head and a double-arm slit shank and the shank of which is passed through the one metal sheet so that the head lies at least indirectly on said sheet and the other sheet is clamped between the slots of the arms of the shank which are arranged parallel to each other, wherein the two arms forming the shank are at a distance apart which is greater than the thickness of the metal sheet which is to be clamped and is equal particularly to a multiple of said sheet thickness, the slot of each arm widening upwardly to bevels at the tops of the arms and extending approximately perpendicular to the head and being bent in the vicinity of the head, the width of the slot at the tops of the arms being about two-thirds the width of the slot at the start of the bend, the bend of the slot the two arms being arranged at approximately the same level and extending in opposite directions so that an interlocking of the sheet metal clamped into the slots is effected.

4,297,050

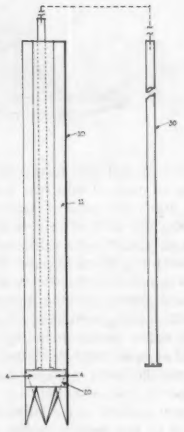
HIGHWAY GUIDE POST

John C. Gmelch, 242 Pleasant St., Wakefield, Mass. 01880

Filed Aug. 15, 1979, Ser. No. 66,807

Int. Cl.³ E01F *9/00*

U.S. Cl. 404—10 **10 Claims**



6. In combination, apparatus characterized as a post to the lower portion of which is fitted a complimentary foot member for attaching and vertically positioning the post, via use of a rigid elongated member, within the soil for delineation of a section of highway, is capable of flexing in any direction, and then rebounding to substantially its original position which comprises:

a resilient, flexible tubular body of trapezoidal cross-section throughout its length, the four walls which adjoin to form the trapezoidal cross-section including parallel walls and adjoining non-parallel walls, one of the parallel walls forming the trapezoidal cross-section being of greater length than the other walls, and said tubular body is constituted of thermoplastic rubber characterized as an elastomeric blend of mono-olefin polymers with polyolefins which is partially cured while in admixture with a resin, and

a foot member of rigid material provided with an upper portion of cross-section corresponding substantially with, and to which said resilient, flexible thermoplastic rubber body is fitted, and retained, and a lower portion which is provided with vertically downwardly projection serrated edges, the edges being beveled, tapered and sharp for cutting into said soil within which said post is to be erected,

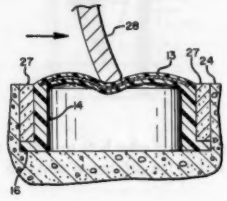
whereby said rigid elongated member can be passed through said resilient, flexible tubular thermoplastic rubber body for contact with said foot member, force being exerted on said elongate member to drive said foot member into the soil, and the elongated member thereafter withdrawn to leave the post in erected position.

4,297,051

DEFORMABLE HIGHWAY MARKER

Jesse L. Robinson, P.O. Box 11544, Tahoe Paradise, Calif. 95708

Filed Jun. 1, 1979, Ser. No. 44,501
Int. Cl.[3] E01F 9/04
U.S. Cl. 404—11 12 Claims



9. A deformable roadway marker installation, comprising;

a bore in the roadway pavement;

a flexible, reslient plastic skirt portion of a rounded shape, having substantially vertical walls, positioned in the bore below the surface of the roadway, with the top of the walls generally flush with the surface of the roadway;

a rounded dome-shaped deformable top of the same material, integrally molded with the skirt portion to form a unitary marker structure, said top being free of angled corners and sharp breaks, meeting the skirt portion walls at a peripheral edge generally flush with the roadway surface and extending above the roadway surface as a visible marker for traffic on the roadway, the top portion being of resilience and deformability such as to be readily deformable downwardly into the space encompassed by the skirt portion under the weight of a snowplow blade on the road; and

grout means retaining the roadway marker in position and sealing its interior such that air is substantially prevented from escaping the interior;

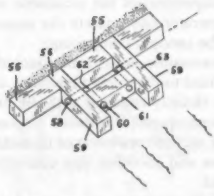
whereby the marker's top will deflect downwardly when struck by the blade of a snowplow and will quickly return to its original configuration, aided by the compression and re-expansion of the air in the interior.

4,297,052

BANK EROSION CONTROL UNITS

William J. Rankin, 37811 Lake Shore Blvd., Willoughby, Ohio 44094

Continuation-in-part of Ser. No. 574,009, May 2, 1975, abandoned, and Ser. No. 755,499, Dec. 29, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,658
Int. Cl.[3] E02B 3/06, 3/14
U.S. Cl. 405—16 5 Claims



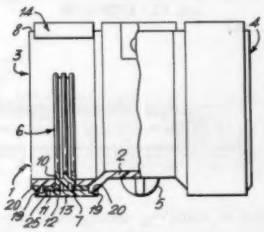
1. Units for controlling erosion of a bank adjacent a body of water due to waves of the body of water striking the bank, which bank extends upwardly from a strand and which units are positioned generally parallel to the shoreline of the body of water, said units comprising a retaining wall means located on the strand and extending generally parallel to the shoreline for restricting material of the bank from progressing into the body of water, means defining a sand-gravel collecting area immediately adjacent said retaining wall means and on the side thereof facing the body of water, said means defining said sand-gravel collecting area comprising structure having surfaces which define a chamber open at the top for receiving water and sand and gravel therethrough and passages for directing water and sand and gravel into the sand-gravel collecting area and from the sand-gravel collecting area toward the shoreline and laterally of said retaining wall and generally parallel to the shoreline, said structure including means for breaking the waves before reaching said retaining wall means and said sand-gravel collecting area, said last-recited means comprising a plurality of wave breakers projecting toward said body of water and from said sand-gravel collecting area against which the waves impact, said wave breakers having respective surfaces facing said body of water and against which waves impact, said respective surfaces being spaced different distances from said retaining wall means.

4,297,053

GUTTERING

Terry G. Nicholas, Berkshire, England, assignor to Wavin B.V., Zwolle, Netherlands

Filed Dec. 19, 1979, Ser. No. 105,401
Claims priority, application United Kingdom, Dec. 20, 1978, 49375/78
Int. Cl.[3] E02B 9/04
U.S. Cl. 405—121 13 Claims



1. A gutter fitting comprising a body member defining a channel for receiving therein a gutter length, a sealing member extending through a slot in said body member, said sealing member having a sealing portion protruding inwardly of said channel for sealing against a gutter length therein in use and a retaining portion extending transversely of said slot and located within a passage defined between the body member and a retaining member extending over the outside of said body member to retain said sealing member in said fitting.

4,297,054

METHOD OF LAYING OFFSHORE PIPELINE FROM A REEL CARRYING VESSEL

Dennis E. Yenzer, Norco; John H. Cha, Orange, and Dan Abramovich, Mission Viejo, all of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

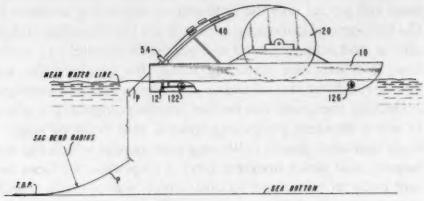
Filed Aug. 8, 1979, Ser. No. 64,826
Int. Cl.[3] B63B 35/04; F16L 1/00
U.S. Cl. 405—168 15 Claims

1. A method of laying pipe offshore from a self-propelled reel pipe laying vessel, said vessel having self-propulsion means, a reel for spooling relatively inflexible pipe thereon, pipe handling means for straightening the pipe as it is unspooled and for guiding the straightened pipe into the water at a presettable adjustable pipe exit angle, and means for maintaining the pipe under a predetermined adjustable tension, said method comprising the steps of:

setting the pipe handling means to establish a desired pipe exit angle at which the pipeline substantially enters its

catenary configuration before exiting the vessel and pipe handling means; and

setting the tensioning means to hold the pipe under a predetermined nominal tension in conjunction with the pipe exit



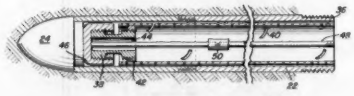
angle, to establish a minimum radius of curvature of the pipe in the sag bend region which is greater than the minimum radius to which that pipe may be bent without exceeding its elasticity limits as it is unspooled and paid out from the vessel.

4,297,055

METHOD OF INSTALLING UNDERGROUND PIPE

Richard C. Peacock, 2726 Waiwai Loop, Honolulu, Hi. 96819

Filed Feb. 8, 1980, Ser. No. 119,826
Int. Cl.[3] E03F *3/06*
U.S. Cl. 405—184 **5 Claims**



1. A method of installing underground pipe comprising forming a horizontal or lateral hole underneath the ground surface by securing a jacking mechanism to one end of a hollow casing, securing a tapered power head at the opposite end of said casing and moving said jacking mechanism to move said power head and associated casing through the ground, providing an open ended flexible tubing, said tubing including an end cap covering one end thereof, inserting a push rod inside said tubing and in contact with said end cap, and after said power head and associated casing have been moved the desired distance pushing said tubing through said hollow casing by use of force applied to said push rod, said push rod contacting said end cap and pushing the tube through said casing without lateral or vertical displacement of said flexible tubing, and removing said push rod and said casing from said power head after said end cap reaches said power head.

4,297,056

METHOD AND H-PILE TIP FOR DRIVING PILES IN PERMAFROST

Dennis Nottingham, 2610 Sorbus Cir., Anchorage, Ak. 99504

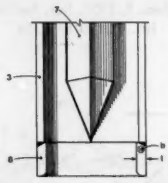
Filed Aug. 3, 1979, Ser. No. 63,381
Int. Cl.[3] E02D *5/74*
U.S. Cl. 405—232 **5 Claims**

1. A method for driving piles in frozen soil comprising the following steps:

a. drilling a pilot hole along the desired pile alignment;

b. inserting water into the pilot hole at a temperature suitably above the freezing point of water; and

c. driving the pile through said pilot hole a predetermined period of time thereafter calculated to permit the transfer of a sufficient amount of heat from the water to the frozen



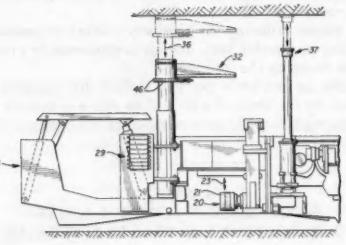
soil surrounding said pilot hole to reduce the resistance of the frozen soil to the driving of said pile.

4,297,057

PIVOTAL ROOF BOLTER AND EXTENDABLE ROTATABLE PROTECTIVE CANOPY FOR MINING MACHINE

John C. O'Neil, deceased, late of Columbus, Ohio (by Jean M. O'Neil, executor), assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 26, 1978, Ser. No. 972,759
Int. Cl.[3] E21D *19/04*
U.S. Cl. 405—303 **5 Claims**



1. A pivotable protective canopy for an underground mining machine which has a work performing apparatus which is pivotable about a vertical axis in order to perform its work at different locations without moving the machine, which canopy is pivotable independent of but associable with the apparatus such that an operator can operate the apparatus while under protection of the canopy, comprising:

a vertically extensible support mast including a first tubular section affixed to the mining machine, and a second tubular section slidably engaged with the first section;

a fluid-pressure operated cylinder disposed interiorally of the tubular sections with one of its ends connected to the first section and its other end connected to the second section; and

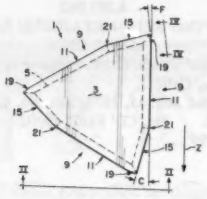
a canopy shield pivotably mounted on the second tubular section and cantileveredly extending therefrom;

wherein the mast and cylinder are cooperatively operable to raise and lower the canopy shield with respect to the mine roof, and the sliding fit between the tubular mast sections is such that all the moment loads from the canopy shield are transferred through the mast sections to the mining machine, while the fluid cylinder incurs substantially only axial compressive load.

4,297,058
INDEXABLE CUTTING INSERT

William D. Armbrust, Greensburg, and James F. McCreery, Latrobe, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Jun. 30, 1980, Ser. No. 164,808
Int. Cl.[3] B26D *1/00*
U.S. Cl. 407—113 11 Claims

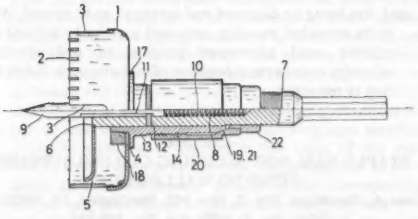


1. An indexable polygonal cutting insert designed to be driven in a forward direction comprising: a top face; a bottom face; a peripheral wall joining said top and bottom faces; said peripheral wall having a plurality of groups of angularly related faces; said angularly related faces within one of said groups having a planar clearance face adjoining said bottom face and obliquely sloping upwardly and outwardly at an acute angle, A; a substantially vertical wiper face, inclined at an acute angle, B, to a vertical plane and having a height, X, interposed between and joining said clearance face to said top face; a planar lead clearance face joining and located forward of said clearance face and inclined at an oblique acute angle, C, forwardly and inwardly from said planar clearance face; said lead clearance face adjoining said bottom face and obliquely sloping upwardly and outwardly at an acute angle, D; a substantially vertical lead wiper face, inclined at an acute angle, E, to a vertical plane and having a height, Y, interposed between and joining said lead clearance face to said top face; said lead wiper face located forward of said wiper face and inclined at an oblique acute angle, C, forwardly and inwardly from said wiper face; a rear relief face joining and located to the rear of said wiper and said clearance faces and joining said top face; and said rear relief face sloping rearwardly and inwardly from said wiper face at an angle, F.

4,297,059
APPARATUS FOR FORMING HOLES IN PLATE GLASS

Masaaki Miyanaga, 5-15-109 Matsuhamacho, Ashiya, Hyogo, Japan

Division of Ser. No. 919,407, Jun. 26, 1978, Pat. No. 4,209,272.
This application Aug. 6, 1979, Ser. No. 64,133
Int. Cl.[3] B23B *51/04*
U.S. Cl. 408—202 1 Claim

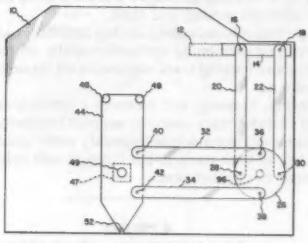


1. A core drill for plate glass, comprising:
a driving spindle,
a slide member slidably surrounding said spindle and having an outer thread and a chuck part, a sleeve having an inner thread for engagement with said outer thread and adapted to compress said chuck part against said spindle so that said slide member is fixed to said spindle,
a cup-shaped blade fixed to said slide member and having cutting teeth at its forward end, said blade having an axial wall formed with at least one axial, forwardly open slot,
stopper means secured to said forward end of said spindle within said blade for preventing said blade from cutting beyond a predetermined depth,
said chuck part including an axially divided portion having and outer taper, and said sleeve having an inner taper for engagement with said outer taper, such that when said sleeve is turned relative to said slide member, said chuck part will be fixed to or released from said spindle.

4,297,060
ENGRAVING MACHINE

Byron W. Ross, 5839 Avenal Ave., Oakland, Calif. 94605

Filed Nov. 1, 1979, Ser. No. 90,493
Int. Cl.[3] B23C *3/00;* B43L *13/10*
U.S. Cl. 409—86 11 Claims



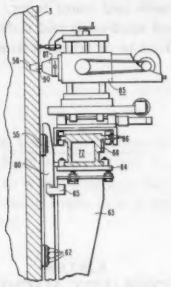
1. A mechanism for duplicating an image which comprises:
a first generally planar surface having a slot therein;
an elongated slide disposed in said slot which is dimensioned and configured to engage said slot to allow movement thereof;
first and second elongated members each having one end pivotally carried on said elongated slide at respectively first and second points spaced a first distance;
a connecting member which is pivotally connected to the other end of said first and second elongated members at third and fourth points thereof, said third and fourth points being spaced said first distance apart;
third and fourth elongated members each having one end pivotally carried on said connecting member at respectively fifth and sixth points which are spaced said first distance apart;
a support pivotally engaging the other end of said third and fourth elongated members at respectively seventh and eighth points which are spaced said first distance;
means for producing an image on an associated member carried on said support; and
means for following an associated master image carried on said support, said means for following comprising an elongated pointed member which is axially spring biased toward the associated master and which is mounted to allow axial movement of said elongated pointed member toward and away from the associated master.

4,297,061

STEAM GENERATOR SHELL PARTING METHOD AND APPARATUS

Donald L. Wolfe, Hampton Township, Allegheny County, Pa.; Donald D. Modglin, Nashville, and George J. Merrick, Franklin, both of Tenn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 10, 1978, Ser. No. 904,686
Int. Cl.³ B23C *1/20, 3/02*
U.S. Cl. 409—131 **4 Claims**



1. Method for effecting horizontal separation of the vertically-extending shell of a steam generator, comprising the steps of:

installing a plurality of hinged-section tension bands at vertical intervals around said shell,

adding vertically extending anchor members clamped to the bands and distributed circumferentially therearound,

hanging and locking track support brackets onto the anchor members,

assembling, locating, and securing a multiple-section rigidized circular track onto the support brackets, and

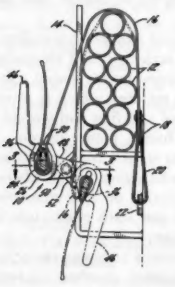
utilizing a milling machine assembly roller guided and supported by such track to cut through said cylindrical shell around its circumference.

4,297,062

CARGO SECURING APPARATUS

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Filed Feb. 14, 1980, Ser. No. 121,373
Int. Cl.³ B62D *63/08*
U.S. Cl. 410—37 **4 Claims**



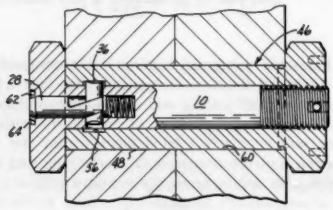
1. A securing apparatus for use with extendable strap means having one of its ends fixed to a support structure and positionable about a cargo to be held, comprising, a generally U-shaped body adapted to be pivotally mounted for rotation about a fixed axis with respect to the support structure, said body defining an opening to receive a looped portion of the free end of said strap means, a shiftable wedge member captively mounted within the body for movement toward and away from said opening to frictionally bind the strap means with respect tc said body, and handle means projecting from said body to pivotally rotate said body about said axis so that said strap means when looped about the wedge member through the body opening is pulled tightly to force said wedge member into binding position within said body opening.

4,297,063

TELESCOPING SELF-RETAINING SAFETY BOLT ASSEMBLY

Dale H. Hart, Seal Beach, Calif., assignor to Hi Shear Corporation, Torrance, Calif.

Filed Jun. 11, 1979, Ser. No. 47,370
Int. Cl.³ F16B *39/02*
U.S. Cl. 411—199 **9 Claims**



1. A self-retaining safety bolt assembly comprising an element having a head, a cylindrical shank with an axis, and an outer cylindrical wall, the element having a first and a second end, an axial passage opening into one of said ends, and a laterally-extending passage in the cylindrical shank and intersecting the axial passage;

a dog in said laterally-extending passage slidably movable between an extended and a retracted position, whereby the dog extends beyond the maximum diameter of the cylindrical shank in the extended position and retracts entirely within said shank in the retracted position;

a cam member axially movable in said axial passage and reactive with said dog to retract or to extend the same;

said cylindrical shank having threads on one end;

biasing means biasing the cam member in a direction which forces the dog toward its extended position;

an element having a radially enlarged head and a tubular shank, said tubular shank having a cylindrical bore with an interior wall adapted closely to fit said outer cylindrical wall, said element having an internal thread;

said tubular shank having an interior groove in said interior wall being axially spaced from said threads in said last named element;

said tubular shank telescopically fitting over said cylindrical shank with the thread of said element engaging the threads on said cylindrical shank;

said dog being so disposed and arranged as to extend, when in its extended position, into said groove in at least one relative axial telescoped position of said elements, whereby to prevent separation of said elements unless said dog is retracted.

4,297,064

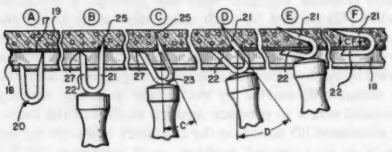
STAPLE-NAIL FOR SECURING CEILING SUPPORT STRIP TO WALLBOARD

Gene A. Berndtson, Rte. 2, Box 145, Barrington, Ill. 60010

Filed Jan. 4, 1980, Ser. No. 109,546
Int. Cl.³ F16B *15/00*
U.S. Cl. 411—470 **4 Claims**

1. As an article of manufacture, a staple-nail for nailing a thin strip of soft steel to a panel of wallboard comprising a length of relatively hard steel wire bent into "U" shape to form substantially straight long and short legs approximately parallel to one

another joined by a bridging portion, the long leg having a length of substantially one and one-quarter to substantially one and five-eighths inch and which is approximately one-quarter inch to approximately three-eights of an inch longer than the short leg, the long leg being chamfered to an acute point, the short leg providing a tip which is chamfered on its inner surface to a less acute point so that when the staple-nail is hammered into the strip the long leg readily penetrates the strip



while the short leg resists penetration serving as a fulcrum for the long leg to impart broadwise swinging movement and the bridging portion being in the form of a unidirectional curve which merges smoothly with the straight legs to that as the long leg continues its penetrating movement is regionally compresses the wallboard in the direction of the strip until the short leg assumes a final position in which it lies flatly and snugly against the strip.

4,297,065

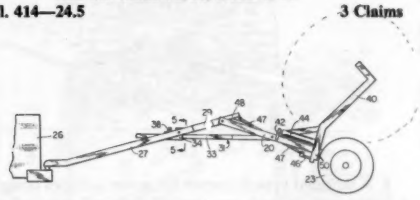
SELF-LOADING APPARATUS FOR TRANSPORTING LARGE BALES OF MATERIAL

Phillip W. Love, P.O. Box 323, Smithville, Tenn. 37166

Filed Apr. 16, 1980, Ser. No. 140,769

Int. Cl.³ A01D *90/02;* **B60P** *1/08*

U.S. Cl. 414—24.5 **3 Claims**



1. Apparatus for picking up and transporting a large bale of material, such as a bale of hay, comprising:

a main frame;

wheel means supporting the main frame through a first pivot axis transverse to the main frame at the rear end portion of the main frame;

braking means for braking the wheels relative to the main frame;

a hitch frame having one end pivotally connected to the front end portion of the main frame, with the other end of the hitch frame adapted to be connected to a tow vehicle, so that when the braking means are activated and the tow vehicle is backed up, the front end portion of the main frame swings upwardly, and when the braking means are activated and the tow vehicle moves forward, the front end portion of the main frame swings back downwardly;

a pair of load engaging and clamping swing arm members pivotally attached to the respective sides of the main frame, each swing arm member being adapted to pivot about an axis substantially parallel to the corresponding side of said main frame to which it is attached; and

means associated with the main frame and hitch frame for pivotally moving the outward ends of the swing arms away from each other when the forward end of the main frame is swung upwardly and, conversely for pivotally moving the outward ends of the swing arms toward each other when the forward end of the main frame moves back downwardly, p1 whereby a bale of material is picked up for transportation by raising the front end portion of the main frame member and positioning the apparatus adjacent to the bale so that the swing arms extend outwardly adjacent opposite ends of the bale of material, applying the braking means, and moving towing vehicle forward to simultaneously lower the front end portion of the main frame and pivotally move the swing arms into engagement with the ends of the bale of material, whereupon the bale is engaged, lifted up, and supported by the swing arms.

4,297,066

PAPER SHEET LAYER FORMING AND TRANSFERRING ARRANGEMENT

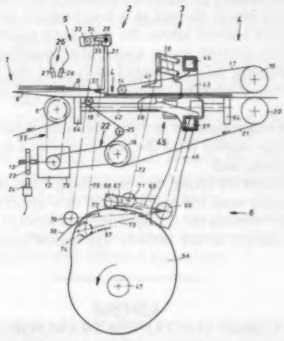
Bernd Ramcke, Hamburg; Karl-Heinz Schlottke, Tangstedt; Eckhard Brandt, and Klaus Reissmann, both of Hamburg, all of Fed. Rep. of Germany, assignors to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,874

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835416

Int. Cl.³ B65H *31/30, 31/32*

U.S. Cl. 414—43 **8 Claims**



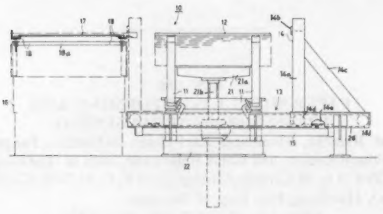
1. An arrangement for forming successive layers of sheets of paper and the like from a stream of individual sheets supplied in succession to a collecting location by a supply conveyor, and for transferring the formed layers to a continuously advancing discharge conveyor, comprising abutment means arranged at the collecting location and movable between a first position in which it extends into, and a second position in which it is spaced from, the stream of the sheets; clamping means including jaws movable together and apart and mounted for movement between the collecting location and the discharge conveyor; and means for moving said abutment means and said clamping means in coordination with one another, including a mechanical transmission interposed between said abutment means and said clamping means, an electric motor kinematically separated from the supply and discharge conveyors and operating said mechanical transmission, and means for controlling the speed of operation of said motor, said controlling means comprising means for effecting acceleration including adjustable counting means, means for effecting deceleration including a first sensor operative to sense a certain position of said clamping means, means for effecting stoppage including a second sensor operative to sense a predetermined initial position of said clamping means, and means for limiting the rotational speed including a signal generator operative to sense the speed of advancement of at least one of said conveyors.

4,297,067

METHOD AND APPARATUS FOR HANDLING PACKED LAYERS OF SUPPORT RODS IN AN ELECTROLYTIC REFINING PLANT

Leo Uusitalo, Tampere, and Pertti Tuominen, Kaaro, both of Finland, assignors to Outokumpu Oy, Finland

Filed Jan. 14, 1980, Ser. No. 111,713
Int. Cl.³ B65G *59/02*
U.S. Cl. 414—114 **9 Claims**



4. Apparatus for handling a plurality of groups of support rods which have been stacked in layers within a transporting and storage crate in an electrolytic refining plant comprising:

transferring means including a pusher member for pushing the uppermost group of supporting rods of the plurality of stacked layers thereof in a longitudinal direction onto a platform located above the seed plate machine;

a platform located above a seed plate machine adjacent the transferring means adapted to receive the group of support rods pushed by the pusher member of the transferring means;

transporting means for moving the support rod group which has been moved onto the platform onto a rod distribution magazine; and

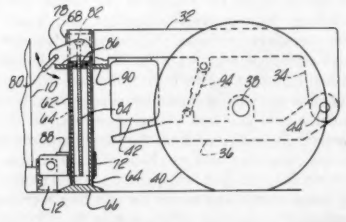
lifting means for lifting the remaining groups of support rods upwardly until the height of the new uppermost group of support rods in the transporting and storage crate is at the same height as the initially uppermost group of support rods.

4,297,068

CARGO CONTAINER TRANSPORTER

Edward Concha, Santa Barbara; Max Jaffe, Pacific Palisades, and Riley Bedford, Torrance, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 21, 1979, Ser. No. 77,862
Int. Cl.³ B60P *3/40*
U.S. Cl. 414—458 **1 Claim**



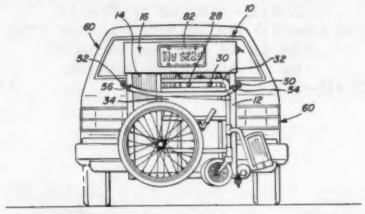
1. A wheeled transporter attachable to one end of a cargo container, said transporter comprising a frame (**32**) have a leading end and a trailing end; said frame having a depending section (**34**) adjacent its leading end; a pair of trailing arms (**36**) swingably connected to the lower end of the frame depending section for movement in vertical planes; a ground-engaged wheel having an axle mounted at an intermediate point on each trailing arm; resilient spring means (**42**) trained between the frame and the rear end of each trailing arm to yieldably resist movement of the wheel in an upward direction relative to the frame; two laterally spaced landing leg mechanisms carried on the frame at corner areas thereof in close adjacency to the cargo container; each landing leg mechanism including inner and outer telescoped tubes bodily adjustable as a unit between a retracted position spaced above ground level and an extended position engaged with the ground, a container lift bracket (**72**) carried by each outer tube at its lower end for connection with a lower corner area of the container, a nut carried on the upper end of each inner tube, a vertical screw carried by each outer tube in meshed engagement with the nut, and means (**78**) carried by each outer tube for rotating the associated screw to produce upward motion of the outer tube and associated lift action on the container when the leg mechanism is in its extended position; each container lift bracket being located to have a lifting line of action in the immediate vicinity of the associated landing leg mechanism whereby the landing leg mechanism effectively absorbs the container load.

4,297,069

CHAIR CARRIER

Byron C. Worthington, P.O. Box 434, Gainesville, Fla. 32602

Filed Jan. 2, 1980, Ser. No. 109,690
Int. Cl.³ B60R *9/06*
U.S. Cl. 414—462 **7 Claims**



1. A wheeled vehicle carrier for motor vehicles comprising: a framework, at least one vertical slide rail attached to said framework; a slide disposed on and movable along said one slide rail; mounting means attached to said slide for mounting a wheeled vehicle thereon; power means for causing powered motion of said slide along said one slide rail; and further including a hood disposed atop said frame and extending outwardly therefrom to cover a portion of said slide and cover a portion of a wheeled vehicle mounted upon said slide in a carrying position, said hood being spaced from said mounting means so as to inhibit the removal of a mounted wheeled vehicle from said mounting means when said slide has moved the wheeled vehicle in a vertical position adjacent said hood.

4,297,070

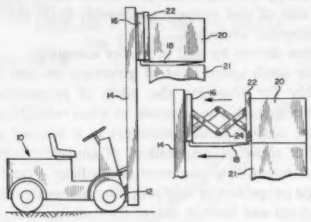
APPARATUS FOR AUTOMATICALLY DEPOSITING A LOAD IN A PREDETERMINED POSITION

Stuart R. Didtel, Gresham, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Dec. 31, 1979, Ser. No. 108,802
Int. Cl.³ B66F *9/075*
U.S. Cl. 414—497 **32 Claims**

14. In a lift truck having a prime mover for selectively driving said lift truck rearwardly, a load-carrying member extending forwardly from said lift truck, a selectively extensible and retractable push frame mounted on said lift truck for pushing a load from said load-carrying member in a direction forwardly of said lift truck by extension of said push frame with respect to said lift truck and selectively actuated push frame power means connected to said push frame for extending said push frame at a speed of extension with respect to said lift truck, the

improvement which comprises synchronizing means connecting said prime mover responsively to said push frame power



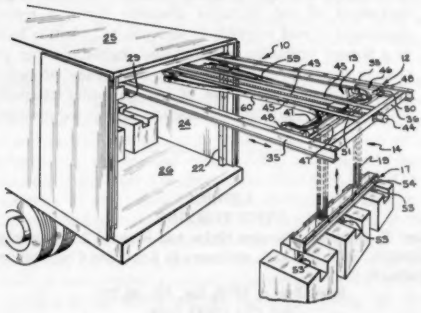
means for actuating said prime mover to drive said lift truck rearwardly in response to actuation of said push frame power means to extend said push frame.

4,297,071

WEIGHT TRANSFER APPARATUS

Glenn G. Dunbar, 2608 Overbrook Dr., Toledo, Ohio 43614

Filed Oct. 1, 1979, Ser. No. 81,026
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—542 **18 Claims**



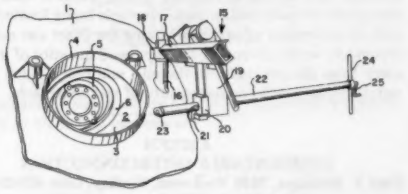
1. A weight handling vehicle having a rear cargo compartment, said cargo compartment having a bed and opposed sidewalls, frame means positioned adjacent said sidewalls, said frame means including a plurality of ribs positioned adjacent said opposed sidewalls and opposed parallel tracks positioned on the end of said ribs spaced apart from said bed, a telescoping carriage means moveably positioned on said tracks of said frame means, carriage rollers positioned on said carriage means to engage said opposed tracks, a drive means operatively connected to said frame means and said carriage means, said drive means acting to move said carriage means, a first guide means connected to said carriage means to maintain said carriage means in alignment with said tracks, a trolley means moveably mounted on said telescoping carriage means, said trolley means being movable from a first position adjacent the front of the rear cargo compartment to a second position exterior of and spaced from the rearward end of said cargo compartment, a second drive means operatively connected to said carriage means and said trolley means, said second drive means acting to move said trolley means, a second guide means connected to said trolley means to maintain said trolley in alignment with said carriage means, and a vertical lifting means mounted on said trolley means for lifting one or more weight units.

4,297,072

MANWAY HANDLING APPARATUS

Siddharth A. Shah, South Portland; Sidney J. Woolcock, Scarborough, and Robert D. Fagan, Cape Elizabeth, all of Me., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1979, Ser. No. 83,280
Int. Cl.³ B66C *23/06*
U.S. Cl. 414—684.3 **11 Claims**



1. Apparatus for handling elliptical manway covers and the like for sealable tanks and shells and located interior thereof comprising:

(a) a support arm;

(b) means for pivotally mounting one end of said support arm on the exterior of the tank or shell adjacent a manway opening therein adapted to receive an internal cover and whereby said arm may be swung horizontally inwardly inboard of said opening;

(c) a shaft slidably movable and rotatable along its longitudinal axis, and lineary adjustable vertically and horizontally relative to said support arm;

(d) means for pivotally coupling one end of said shaft to the center of a cover interior of said opening;

(e) means for actuating said shaft linearly for inserting said cover into and removing said cover from said opening by motion inwardly of said opening; and

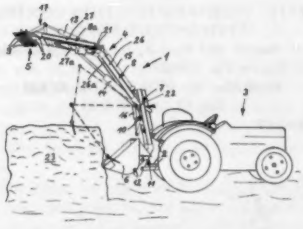
(f) means for rotating said shaft to enable rotation of said cover about the axis of said shaft interior of said opening during insertion and removal operations.

4,297,073

METHOD AND APPARATUS FOR WITHDRAWING AGRICULTURAL MATERIALS FROM STORAGE

Franz Schmid, Bergstr. 5, and Reinhard Schmid, Vordertal 2, both of D-7612 Fischerbach, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,616
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830068
Int. Cl.³ B65G *65/04*; A01F *25/20*
U.S. Cl. 414—704 **16 Claims**



2. Apparatus for withdrawing pressed agricultural material from a pile of such material, comprising vehicle-mounted supporting means; a mobile material engaging tool having a predetermined width; an arm for said engaging tool, said arm having a first portion articulately connected with said support-

ing means and a second portion articulately connected with said first portion and said tool; means for moving said engaging tool relative to said arm and for moving said portions relative to each other as well as relative to said supporting means so that said tool can be caused to penetrate into the pile of pressed material from above to separate a quantity of material from the pile while leaving the consistency of the remainder of the material of the pile at least substantially unchanged; and a vehicle-mounted receptacle pivotable between a plurality of positions and having an opening whose width at least equals said predetermined width, said receptacle being located in the path of movement of said tool so that the latter can enter the receptacle while advancing the separated quantity of material away from the remainder of the pile, said first portion of said arm being moveable independently of said receptacle.

4,297,074

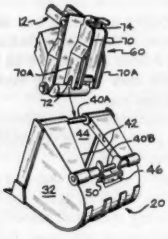
DEMOUNTABLE INTERCONNECTION

Paul V. Ballinger, 7630 Westwood, Findlay, Ohio 45840

Filed Jan. 7, 1980, Ser. No. 110,238

Int. Cl.³ E02F *3/81*

U.S. Cl. 414—723 **15 Claims**



1. Apparatus for use with material handling equipment comprising, in combination, a first engageable member for securement to an implement and a second engageable member for securement to said implement, said first and said second members generally defining parallel radially spaced-apart axes, a locking structure rotatably disposed about one of said members and moveable between a first, unlocked position and a second, locked position, and a carriage adapted for securement to a boom of a material handler, said carriage defining at least one first slot for engaging said first member and at least one second slot for engaging said second member, and means for selectively maintaining said locking structure in said second, locked position.

4,297,075

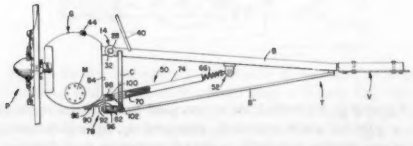
AUTOMATIC STORM PROTECTION CONTROL FOR WIND ENERGY SYSTEM

Marcellus L. Jacobs, and Paul R. Jacobs, both of Rte. 13 - Box 722, Fort Myers, Fla. 33908

Filed May 14, 1979, Ser. No. 38,885

Int. Cl.³ F03D *7/04*

U.S. Cl. 416—14 **7 Claims**



1. A means for protecting a wind energy plant against damage thereto caused in high winds comprising:

a propeller assembly pivotally mounted on a wind energy plant support means;

a hypoid gear drive means mounting said propeller assembly on said support means, said gear drive means offsetting the pivot axis of said propeller assembly from the center of that propeller assembly;

a generator driven by said propeller assembly;

a variable pitch speed control governor on said propeller assembly for changing the pitch of propellers of said propeller assembly in response to wind velocity generated pressure against those propellers in a manner such that propeller speed is independent of any electrical load on said generator, said governor controlling propeller speed until the propellers of said propeller assembly reach maximum speed and feather, means for keeping said propellers facing directly into the wind over the entire power producing range of wind speed until said propellers feather;

pivot means pivotally connecting said propeller assembly to a tail assembly of a wind energy plant, said pivot means including pivot control means for actuating said pivot means after said propellers have feathered so that said propeller assembly will pivot with respect to said tail assembly and said plant support means under the influence of wind pressure exerted on said propeller assembly because of the combination of the hypoid gear drive propeller axis offset and the increased wind pressure created against the feathered propellers when the pitch angle of such propellers is no longer changed by the action of said variable pitch speed control governor; and

said pivot control means further including a snubber assembly connected to said propeller assembly for controlling movement of said propeller assembly during a return movement of said assembly from a pivoted position back to a normal operating position, said snubber further including means for bypassing the control of said propeller assembly during movement of said propeller assembly from a normal operating position to said pivoted position.

4,297,076

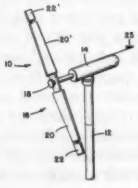
WIND TURBINE

Robert E. Donham, Sherman Oaks, and Richard L. Heimbold, Glendale, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Jun. 8, 1979, Ser. No. 46,771

Int. Cl.³ F03D *7/04*

U.S. Cl. 416—37 **13 Claims**



1. A wind turbine comprising:

a rotor, said rotor including a plurality of blades, the tip portions of said blades being variable in pitch and adapted to aerodynamically interact with the wind;

support means for supporting said rotor;

load measurement means coupled to said blades for measuring the bending moment on said blades and for providing an output signal representative thereof; and

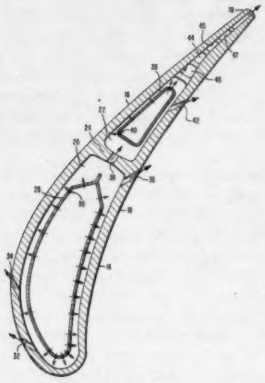
adjustment means coupled to said load measurement means for varying the pitch of said tip portions in response to said output signal.

4,297,077

COOLED TURBINE VANE

George A. Durgin, Schenectady, and Daniel E. Demers, Melrose, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 9, 1979, Ser. No. 55,833
Int. Cl.[3] F01D 5/08
U.S. Cl. 416—97 R 8 Claims



1. A turbine vane having an airfoil portion providing a leading edge, a suction side, a pressure side and a trailing edge, and wherein said airfoil portion is generally hollow to define an internal chamber to receive cooling air, a slit from said internal chamber through said trailing edge generally throughout the radial extent of said airfoil portions, and wherein the opposed internal walls defining said slit converge from generally a broad inlet area adjacent said chamber to a relatively narrow passage downstream thereof, a plurality of radial rows of pin-like members extending transversely across said slit and integral with the opposed walls defining said slit, and wherein the members of each row are radially offset with respect to the members of any adjacent row to intercept the cooling air flowing through said slit at different levels, a hollow insert disposed within said chamber for initially receiving at least a portion of the cooling air entering said chamber, said insert having a wall member generally adjacent said slit inlet area and apertures in said insert wall for directing cooling air exiting therethrough primarily in a direction to impinge on a selected plurality of junctures of said members and at least one wall of said slit to provide sufficient velocity in said cooling air to cause said juncture to induce turbulence in said cooling air as it flows adjacent said wall and downstream of said juncture to effectively cool said vane.

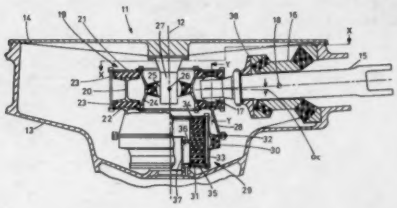
4,297,078

HELICOPTER ROTORS

Alfred C. Martin, Shepton Mallet, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed May 9, 1979, Ser. No. 39,492
Claims priority, application United Kingdom, May 17, 1978, 20226/78
Int. Cl.[3] B64C 27/38
U.S. Cl. 416—134 A 25 Claims

1. A helicopter rotor including a rotor head arranged to support a plurality of rotor blades for rotation about a generally vertical axis, said rotor head including, for each rotor blade, an elastomeric bearing having a geometric center and arranged to permit flap, lead/lag and feathering movements of its associated rotor blade, a lead/lag damper, and resilient support means axially spaced apart from said bearing geometric center and arranged during operation to provide controlled restraint of blade flap movements.

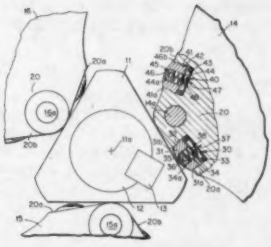


4,297,079

VARIABLE PITCH MARINE PROPELLER

Don J. Marshall, Churchton, Md., assignor to Goodall SemiMetallic Hose & Mfg. Co., Chestertown, Md.

Filed Jul. 14, 1980, Ser. No. 168,034
Int. Cl.[3] B63H 1/22
U.S. Cl. 416—140 10 Claims



1. A variable pitch marine propeller comprising:

a hub having a central axis of rotation for coaxial mounting on a rotatable shaft;

a plurality of circumferentially spaced apart blades pivotally mounted on axles on said hub through the root portion of said blades to permit independent movement of each of said blades about an axis of rotation substantially parallel to the axis of said hub between a first nested position adjacent said hub and a second extended position;

each of said blades including leading and trailing segments in said root portion of said blades which are hub engageable depending upon the direction of initial rotation of said blades;

cushioning means having at least a portion thereof intermediate said leading and trailing segments of said blades and said hub and mounted in one of said blades and hub for inhibiting the shock of engagement of said blades and said hub;

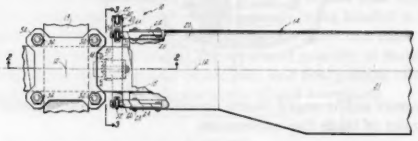
said cushioning means including water entrance and exit means and means to capture water therein to act as a shock absorber for said blades and hub upon commencement of rotation of said hub.

4,297,080

ROTOR BLADE PITCH CONTROL LINKAGE

Timothy A. Krauss, Sandy Hook, and Stephan Roman, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1979, Ser. No. 104,605
Int. Cl.³ B64C *27/38*
U.S. Cl. 416—141 **6 Claims**



1. A helicopter rotor having:

(A) a hub mounted for rotation about an axis,

(B) at least one blade extending radially from said hub and supported therefrom for rotation therewith and including:

(1) a radially extending flexible spar member connected to the hub to be rotatable therewith,

(2) an airfoil section supported from the spar for rotation therewith, and including:

(a) a torque tube enveloping the flexible spar and connected thereto at a radial station therealong and extending inwardly from said radial station to form the inner end of the airfoil sections

(C) pitch control and support means connected to the inner end of the torque tube and forming a parallelogram therewith including:

(1) a bell crank pivotally connected to the hub, and

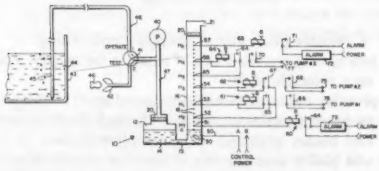
(2) two side link members of equal length connecting opposite ends of the bell crank to the torque tube to thereby form a substantially vertically oriented parallelogram linkage among said bell crank, side links, and torque tube.

4,297,081

LIQUID LEVEL CONTROL SYSTEM

William A. Irvin, 2384 Corbett St., Jacksonville, Fla. 32204

Filed Nov. 5, 1979, Ser. No. 91,102
Int. Cl.³ F04B *41/06, 49/00*
U.S. Cl. 417—2 **16 Claims**



1. In a system for controlling the level of a liquid in a reservoir, said system having motor driven pumps for filling and emptying the reservoir, the pump control subsystem comprising:

an air pressure line having one end thereof disposed in said liquid;

air pump means for producing pressure in said air pressure line in which said pressure is proportional to the level of said liquid;

a mercury manometer utilizing a U-tube and having a pressure input to a first vertical mercury column connected to said air line and an outlet for a second vertical mercury column open to atmospheric pressure;

a common electrical contact disposed at the base of said U-tube and in conductive contact with said mercury columns;

a plurality of electrical pump-up control contacts disposed along said vertical mercury column below the zero pressure level of said mercury, said contacts adapted to be sequentially contacted as said mercury column rises in response to drops in said pressure and to thereby provide a conductive path from said column contact to each pump-up control contact contacted;

a plurality of electrical pump-down control contacts disposed along said second vertical mercury column above the zero pressure level of said mercury, said contacts to be sequentially contacted as said second mercury column rises in response to increases in said pressure and to thereby provide a conductive path from said common contact to each pump-down control contact contacted; and

pump motor control means connected to selected ones of said pump-up and pump-down control contacts for providing a pump starting function when said mercury columns make contact with specific ones of said control contacts and a pump stopping function when said mercury columns breaks contact with other ones of said control contacts; and

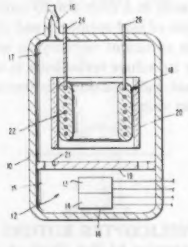
subsystem test means connected to said pump and said input to said first vertical mercury column for controlling said pressure to vary from a zero value to a predetermined maximum value to thereby cause said first mercury column to fall and said second mercury column to rise and to therefore sequentially contact each of said control contacts for testing of said pump starting and said pump stopping functions.

4,297,082

VACUUM GETTERING ARRANGEMENT

Howard P. Wurtz, and Eugene W. Peterson, both of Santa Barbara, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 21, 1979, Ser. No. 96,583
Int. Cl.³ F04B *37/02*
U.S. Cl. 417—51 **19 Claims**



1. A vacuum gettering system comprising:

a first getter, said first getter being a bulk getter;

a second getter, said second getter being a bulk getter;

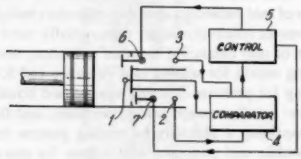
a vacuum enclosure enclosing both said first and second getters in communication with each other; and

means for heating both said first and second getters so that when gas is pumped from said vacuum enclosure, said second getter can be heated to an activation temperature to drive off adsorbed gases on said second getter to activate said second getter without high temperature baking of the entire vacuum enclosure.

4,297,083
POSITIVE CONTROL SYSTEM FOR PISTON COMPRESSOR VALVES

Curt von Petery, Denkendorf, Fed. Rep. of Germany, assignor to Gutehoffnungshütte Sterkrade A.G., Oberhausen, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 91,951
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849048
Int. Cl.³ F04B *39/08*
U.S. Cl. 417—53 **2 Claims**



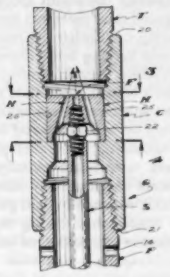
1. Positive control system for opening and closing piston compressor valves comprising a piston compressor including a cylinder forming a suction-compression space, a piston reciprocally mounted in said space for alternately effecting a suction stroke and a compression stroke, a suction line for supplying gas into said space, a delivery line for conveying gas out of said space, a suction valve in said suction line, and a delivery valve in said delivery line, wherein the improvement comprises a rated value comparator unit, a first pressure sensor located in said space and connected to said comparator unit, a second pressure sensor located in said delivery line and separated from said space by said delivery valve, said second pressure sensor being connectible to said comparator unit during the compression stroke of said piston, a third pressure sensor located in said suction line and separated from said space by said suction valve, said third pressure sensor being connectible to said comparator unit during the suction stroke of said piston, a control unit, a conduit connecting said comparator unit and said control unit, a first control line extending between said control unit and said delivery valve, a second control line extending between said control unit and said suction valve, so that during the suction stroke said first and third pressure sensors convey signals to said comparator unit and based on the differential in pressure sensed and rated differential value said comparator unit conveys a signal to said control unit for selectively opening said suction valve when the differential pressure is equal or approximately equal to zero and for selectively closing said suction valve when the differential pressure varies by a specific value, and during the delivery stroke said first and second pressure sensors convey signals to said comparator unit and based on the differential in pressure sensed and a rated differential value said comparator unit conveys a signal to said control unit for selectively opening said delivery valve when the differential pressure is equal or approximately equal to zero and for selectively closing said delivery valve when the differential pressure varies by a specific value.

4,297,084
GAS ANCHOR

Newell E. Wayt, 2272 Dominguez St., Torrance, Calif. 90501

Filed Dec. 10, 1979, Ser. No. 101,624
Int. Cl.³ F04F *5/46*
U.S. Cl. 417—179 **5 Claims**

1. A gas anchor comprising an elongate vertical coupling with means at its upper end to connect with the lower end of a production tubing, an elongate vertical pipe with an upper end connected with the lower end of the coupling, said pipe having an upper perforated portion to allow for the flow of gas and liquid radially into and out of the pipe and having a closed lower end defining a liquid catch basin below said upper perforated portion, aspirator means within the coupling including an upwardly opening central liquid conducting means and gas jet nozzle means about the central liquid conducting means and communicating with the pipe below the coupling and directing gas longitudinally upwardly and radially inwardly to converge

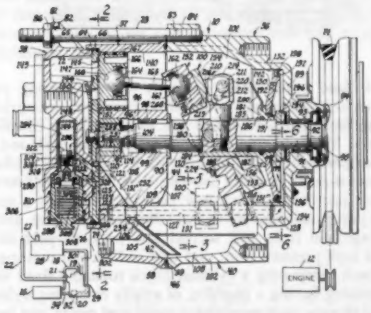


above the liquid conducting means in aspiratory relationship therewith and an elongate vertical liquid conducting stinger with an upper end communicating with said liquid conducting means and a lower end communicating with said catch basin.

4,297,085
GUIDE MECHANISM FOR COMPRESSOR SOCKET PLATE

Byron L. Brucken, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1979, Ser. No. 89,996
Int. Cl.³ F04B *1/28*
U.S. Cl. 417—222 **3 Claims**



1. In a variable stroke wobble plate type compressor having a cylinder block, a drive shaft rotatable in said cylinder block a plurality of cylinder bores in said block substantially parallel to the axis of said shaft, pistons arranged to reciprocate in said cylinder bores, a journal plate operated in response to rotation of said drive shaft and drivingly connected to said pistons, the connection of said journal plate to said pistons including a socket (wobble) plate is relatively slidable interface relation with said journal plate, and means for varying the angle of the journal plate relative to said drive shaft and thus the stroke of the pistons in their bores, the improvement comprising a longitudinally extending guide rod supported in a common plane with said drive shaft, said socket plate provided with a radially extending slot of predetermined size receiving said guide rod therethrough for longitudinal and arcuate travel of said socket plate along said rod as a result of said journal plate movement, said slot having semi-cylindrical radially extending guides on opposing surfaces thereof, a bearing body having a central passage through which said rod extends with said central

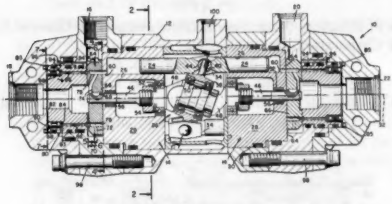
passage being defined by an inner surface which conforms to and slidably engages the outer surface of said rod, said bearing body having a convex spherical portion thereon, a pair of semi-cylindrical shaped guide shoe members positioned in said slot on opposite sides of said bearing body, each of said guide shoe members configured to conform with its associated guide for radial sliding contact therewith spread over a substantial area, each of said guide shoe members having a concave semi-spherical recess facing each other for receiving and relatively slidably retaining said bearing body convex spherical portion therebetween for relative swiveling movement with a substantial contact area, each of said guide shoe members at each end of said concave semi-spherical recess having a portion substantially slidably bearing on said guide rod to maintain the guide shoe members in substantially parallel planes, whereby said guide shoe members reciprocate radially in their associated guides and reciprocate longitudinally along said rod together with said bearing body retained by said guide shoe members in relative swiveling relationship during the operation of said journal plate in response to rotation of said drive shaft.

4,297,086

FLUID MOTOR-PUMP UNIT

Peter T. McGowan, Fort Lauderdale, Fla., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 16, 1979, Ser. No. 12,913
Int. Cl.³ F04B *1/16, 17/00;* **F01L** *33/02*
U.S. Cl. 417—271 **22 Claims**



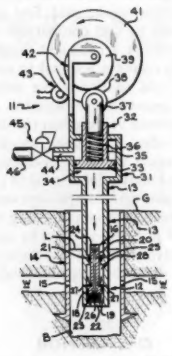
1. A fluid motor-pump assembly for transferring power between first and second hydraulic fluid systems, comprising a housing having first high and low pressure ports coupled to said first hydraulic fluid system and second high and low pressure ports coupled to said second hydraulic fluid system; a first motor-pump unit for moving fluid from said first high pressure port to said first low pressure port, and a second motor-pump unit driven by said first motor-pump unit for pumping fluid from said second low pressure port to said second high pressure port, said first and second motor-pump units each comprising a cylinder block rotatably fixed within said housing having a plurality of axially extending cylinders formed therein each receiving a reciprocal piston and including a cylinder block port for communication with the associated high and low pressure ports, a central rotatable shaft within said housing with said cylinders circumferentially arranged with respect thereto, means coupled between said shaft and said pistons for converting between rotational and reciprocal motion, a valve plate rotatable with the shaft in running alignment with said cylinder block and between the associated high and low pressure ports, said valve plate including valve ports for sequentially communicating said cyclinder block ports respectively with the associated high and low pressure ports upon shaft rotation, and a pressure-balancing member rotatably fixed within said housing in running alignment with said valve plate opposite said cylinder block and including a plurality of means generally aligned axially with respective ones of said cylinder block ports and each responsive to fluid pressure at its associated cylinder block port for urging said member axially against said valve plate for dynamically pressure-balancing axial forces applied to said valve plate regardless of the position of valve plate rotation, said plurality of means of each of said first and second motor-pump units includes a plurality of circumferentially arranged, generally axially extending fluid passages formed in said pressure-balancing member for communicating with said cylinder block ports through said valve ports upon valve plate rotation for receiving fluid under pressure whereby the fluid pressure within each said passage corresponds with the fluid pressure on the opposite side of said valve plate regardless of valve plate rotational position, each of said passages comprising a relatively small orifice passage for communicating with said valve ports, and a relatively enlarged cylinder, said relatively enlarged cylinders formed within said pressure-balancing member being radially staggered with respect to each other, radially inwardly staggered ones of said balancing member cylinders being formed to have a diameter relatively larger than radially outwardly staggered ones of said balancing member cylinders, and including fluid sealing means for sealing said passages and for engaging said housing for pressure-reacting against said housing to urge said member axially toward said valve plate, said fluid sealing means comprising a plurality of sealing pistons respectively received within said passages; said means for converting between rotational and reciprocal motion being common to said first and second motor-pump units whereby said second motor-pump unit is drivingly operated by said first motor-pump unit for power transfer therebetween, said valve plates of said first and second motor-pump units being mounted on their respective shafts generally in phase with each other.

4,297,087

APPARATUS FOR PUMPING FLUID FROM A WELL THROUGH A TUBING STRING

Neil H. Akkerman, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Aug. 23, 1979, Ser. No. 69,209
Int. Cl.³ F04B *9/08*
U.S. Cl. 417—378 **27 Claims**



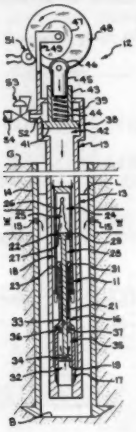
1. An apparatus for pumping fluid from a subterranean well through a tubing string, comprising: pump means connected to the tubing string and responsive to the cyclic application of pressure to the fluid in the tubing string for pumping fluid from the well into the tubing string; and means for cyclically applying pressure to the fluid in the tubing string to actuate said pump means and to supply energy to the tubing string, said means for cylically applying pressure being responsive to the fluid in the tubing string to capture and substantially reuse said energy within and through the tubing string.

4,297,088

PUMP ASSEMBLY COMPRISING GAS SPRING MEANS

Neil H. Akkerman, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Sep. 7, 1979, Ser. No. 73,335
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—378 **28 Claims**



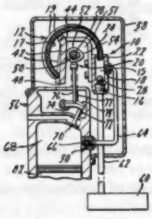
1. In an apparatus for pumping fluid from a source through a conduit, including pump means connected to the conduit and responsive to the cyclic application and withdrawal of pressure to the fluid in the conduit for pumping fluid from the source into the conduit, the pump means comprising: piston means for pumping the fluid and responsive to the application of pressure to the fluid in the conduit for moving in a first direction; gas spring means for moving said piston means in the opposite direction when said pressure is removed from the fluid in the conduit; a fluid filled chamber defined by a cylinder closed at one end by said piston means and at another end by said gas spring means and in fluid communication between said piston means and said gas spring means; and means for connecting said chamber to the conduit to replace any fluid lost from said chamber during the operation of said piston means.

4,297,089

ARCUATE TUBULAR PUMP

Dante S. Giardini, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,278
Int. Cl.³ F01B *19/00*; F04B *45/06*
U.S. Cl. 417—437 **15 Claims**



1. A fuel pump for pumping noncompressible fuel to a multi-chambered internal combustion engine comprising:

a plurality of C-shaped tubular members being resiliently flexible in a generally radial direction;

each C-shaped tubular member being arced about a common line;

each C-shaped tubular member having a hollow interior;

a housing member anchoring one end of each C-shaped tubular members;

said housing member connected to said engine;

said housing member having a plurality of passageways;

each passageway having an inlet and outlet;

each of said hollow interiors of each respective C-shaped tubular member in fluid communication through said respective anchored end with said passageway between said inlet and outlet;

a one-way check valve means operably connected to said inlet for allowing fuel to pass through said inlet into said passageway;

camming means mounted in proximity to a free opposing end of each C-shaped tubular members and opposing said anchored ends movable to flex said free ends to change the volume of said hollow interiors a predetermined amount and movable to allow said C-shaped tubular members to resiliently flex back to return the volume of said hollow interiors to their initial amounts, whereby fuel passes into each hollow interior and is forced out from each hollow interior through said outlets upon a decrease in volume of said hollow interiors;

said camming means sequentially flexing and releasing each C-shaped tubular member in a pedetermined sequence corresponding to the firing sequence of the respective combustion chambers of said engine;

a cam shaft rotatably mounted about its longitudinal axis through a generally convex shaped area bordered by said C-shaped tubular members;

a plurality of cams on said cam shaft;

a plurality of deflector members pivotably connected about substantially aligned pivot axes to said C-shaped tubular members in proximity of said free end spaced away from said pivot axes;

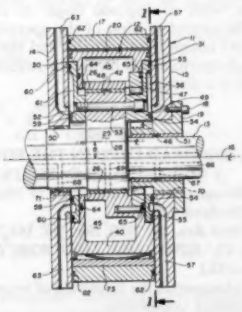
said respective cams abutting said deflector member at a distance from where said deflectors abut said C-shaped members.

4,297,090

ROTARY EXPANSION POWER UNIT WITH VALVE DISC CONNECTED TO CRANKSHAFT

Ralph M. Hoffmann, Eden Prairie, Minn., assignor to Trochoid Power Corporation, Eden Prairie, Minn.

Filed Oct. 29, 1979, Ser. No. 89,220
Int. Cl.³ F01C *1/22, 19/00, 21/12*
U.S. Cl. 418—61 A **13 Claims**



1. A rotary expansion power unit including a housing having opposite end walls spaced apart along a first axis by a peripheral wall shaped to define an epitrochoidal cavity symmetrical about said first axis, a rotor symmetrical about a second axis, parallel to said first axis, and movable in said cavity in sealing

relationship to define a plurality of working chambers, crankshaft means, having an eccentric member on which said rotor rotates on said second axis eccentrically with respect to said first axis, for limiting motion of said rotor in said cavity to planetating movement about said first axis, and means for conducting and controlling expansion fluid flow into and from said working chambers comprising:

at least one valve disc secured to a corresponding side face of said eccentric member and extending between a corresponding said end wall and said rotor, said at least one valve disc defining an annular disc cavity facing said corresponding end wall,

supply passage means for directing a continuous flow of expansion fluid to said disc cavity,

bridging passage means in the inner surface of said corresponding end wall to conduct expansion fluid from said disc cavity to said working chambers during first predetermined portions of rotor movement, and

exhaust passage means for affording egress of expansion fluid from said working chambers during second predetermined portions of rotor movement.

4,297,091

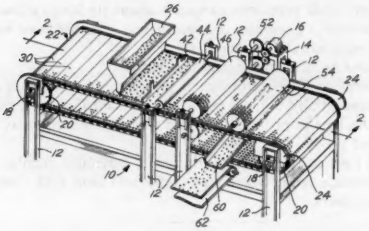
ALFALFA PELLETIZING APPARATUS

Michael R. Strefling, 425 S. 27th St., South Bend, Ind. 46615

Filed Mar. 10, 1980, Ser. No. 129,398

Int. Cl.³ A01F *29/00*; B29J *1/00*

U.S. Cl. 425—84 **8 Claims**



1. Apparatus for pelletizing small alfalfa particles mixed with water comprising a frame, spaced sprockets journaled on said frame, a belt unit trained around said sprockets, means for driving a sprocket, said belt having a plurality of pellet-forming open ended apertures therein and a drain passage located at the central portion of each aperture, opposed pelletizing rollers journaled on said frame and each including a plurality of pelletizing fingers, each finger being adapted to enter an aperture and cooperate with an opposed finger to compress alfalfa particles in the central portion of the aperture and to expel liquid from said compressed particles and through said drain passage of each aperture, and means for releasing pellets from said apertures at a discharge station.

4,297,092

ACCUMULATOR HEAD USED IN THE FORMATION OF A MULTI-LAYER PARISON

John Goron, Bridgewater, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 30, 1980, Ser. No. 164,787

Int. Cl.³ B29D *23/03, 23/04*; B29C *17/07*

U.S. Cl. 425—133.1 **15 Claims**

1. An apparatus used in the formation of an article composed of resinous material, comprising:

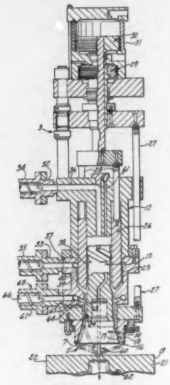
(a) at least one annular accumulation chamber for receiving and holding resinous material, the chamber having a longitudinal axis;

(b) an annular discharge orifice spaced from the chamber;

(c) an annular discharge passageway connecting the orifice and chamber, the portion of the passageway leading from the chamber being cylindrical about a longitudinal axis which coincides with the longitudinal axis of the chamber;

(d) an annular ring-piston disposed in the chamber and movable axially thereof, to force resinous material from the chamber through the discharge passageway and orifice;

(e) an annular compartment with a circular cross-section surrounding the cylindrical portion of the discharge passageway;



(f) an annular entrance opening in the cylindrical portion of the passageway between the chamber and orifice;

(g) an annular entrance passageway connecting the compartment and entrance opening, the entrance passageway converging in the direction of the discharge orifice; and

(h) means communicating with the compartment for moving resinous material into the compartment and through the entrance passageway and opening into the discharge passageway.

4,297,093

COMBUSTION METHOD FOR REDUCING NOX AND SMOKE EMISSION

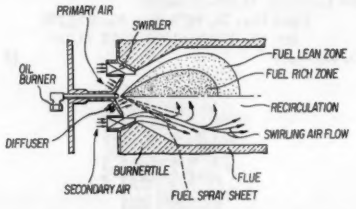
Kotaro Morimoto, and Tomio Suzuki, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Aug. 31, 1979, Ser. No. 71,487

Claims priority, application Japan, Sep. 6, 1978, 53-110003

Int. Cl.³ F23M *3/00*

U.S. Cl. 431—10 **8 Claims**



1. A combustion method for reducing the emission of NOx and smoke in a boiler or furnace having a combustion chamber, a burner and a passage of combustion air around said burner, comprising:

injecting fuel from a fuel injector into a fuel rich zone of said combustion chamber and with a predetermined spread angle;

introducing combustion air with low velocity into said fuel rich zone; and

utilizing a swirler located in said passage for combustion air

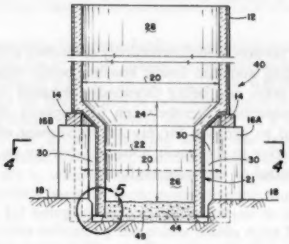
at a distance of not greater than 200 mm from said fuel injector to swirl combustion air into a fuel lean zone surrounding said fuel rich zone, wherein said swirler is adjusted to provide the swirled air with a mean velocity between 10 m/sec and 30 m/sec, with a swirl number between 0.35 and 1.5 and with a spread angle greater than said spread angle of said fuel, wherein said fuel and said low velocity combustion air in said fuel rich zone are enveloped by said swirled air, whereby the rapid mixing of fuel and air in the initial stage of combustion is suppressed.

4,297,094

FREE-FLOATING COMBUSTION CHAMBER AND STACK

Robert D. Reed; Robert E. Schwartz, and Raymond D. Kraft, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 19, 1980, Ser. No. 122,274
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—202 **8 Claims**



1. An improved structure for a burner-stack-furnace system comprising:

(a) a horizontal base ring of selected horizontal shape and size;

(b) a vertical stack of selected height, and of horizontal shape and size related to said base ring, attached to and supported on said base ring;

(c) a plurality of circumferentially-spaced support columns of selected height arranged in a ring of shape and size to receive and support said base ring;

(d) a combustion section of substantially the same size and shape in cross-section as said stack, and including a plurality of re-entrant vertical channels in the outer wall of said combustion section, one positioned at each of the positions of said support columns, the dimensions of said channels such as to provide air space between said columns and said outer wall; said combustion section penduously supported from said support ring;

(e) said combustion section having at least one opening through its circumferential wall in the spaces between columns, for the insertion of at least one fuel burner.

4,297,095

FILAMENT WINDING APPARATUS

David R. Silcox, Gainesville, and John L. Doster, Oakwood, both of Ga., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 28, 1980, Ser. No. 116,260
Int. Cl.³ F27B *9/28;* B65H *54/20, 54/42*
U.S. Cl. 432—59 **9 Claims**

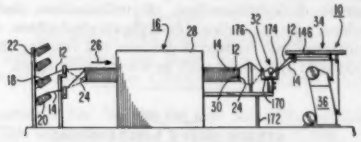
1. A filament winding apparatus comprising:

means for transporting a plurality of filaments wound side by side about a moving core, each filament being in contact with said core,

means for heat setting said filaments during said transporting,

adjustable filament tension control means for simultaneously receiving said plurality of filaments from said means for transporting and for applying substantially identical tension to each of said received filaments during the time the filaments are being wound by the winding means set forth below, said tension control means including a pair of facing members and means for adjustably resiliently urging said members together, the facing surfaces of said members receiving said filaments therebetween, each said facing surface being in contact with each filament, and

winding means including means for receiving a like plurality of filament receiving spools for simultaneously winding



each of said filaments on a different spool, said winding means including a like plurality of friction drive means, each drive means for rotating a corresponding spool by frictional engagement with the outer surface of the windings on the spool, means for urging each friction drive means into continuous engagement with the outer surface of its corresponding spool with negligible slippage between said friction drive means and said outer surface, and timing means for synchronously rotating each of said plurality of, friction drive means.

4,297,096

ALKYL, ALKENYL, AND ARYL SUBSTITUTED TRIAZENE COMPOUNDS, THEIR SALTS AND PRODUCTION THEREOF

Keizo Yoshida, Ibaraki; Hirokazu Tanaka, Takarazuka; Masanori Okamoto; Eiko Iguchi, both of Osaka; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co. Ltd., Osaka, Japan

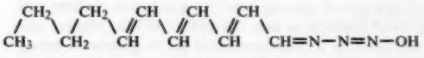
Continuation-in-part of Ser. No. 18,158, Mar. 7, 1979, abandoned, and a continuation-in-part of Ser. No. 92,476, Nov. 8, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,310
Int. Cl.³ A01G *47/08, 51/00;* C07C *107/02;* C12P *13/00*
U.S. Cl. 435—128 **11 Claims**

1. A compound of the formula:

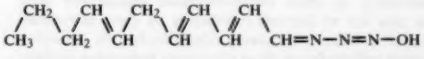
R—CH=N—N=N—OH

wherein R is alkyl, alkenyl or aryl or its pharmaceutically acceptable salts.

10. A process for the production of FR-900184 substance having the formula:



or FR-900190 substance having the formula



or both, which comprises culturing a FR-900184 and/or FR-900190 producing strain belonging to the genus Streptomyces in an aqueous nutrient medium under aerobic condition and recovering FR-900184 or FR-900190 or both substances from the resultant cultured broth.

11. A process for the preparation of the compound of the formula

R—CH=N—N=N—OH

wherein R is alkyl, alkenyl or aryl or its pharmaceutically acceptable salts, which comprises reacting a compound of the formula

RCHO

wherein R is the same as defined above, with hydrazine, reacting the resultant hydrazone derivative with a silylating agent taken from the class consisting of trialkylhalosilane, trialkylsilylamide, dialkyldihalosilane, alkyltrihalosilane, dialkylarylhalosilane, triarylhalosilane, dialkylaralkylhalosilane, dialkoxydihalosilane, and trialkoxyhalosilane and reacting the resultant silylated compound with an n-nitrosating agent.

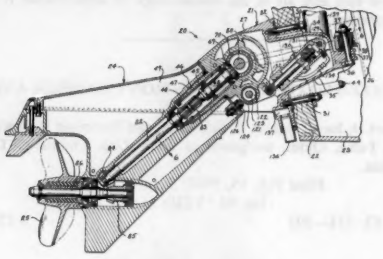
4,297,097

STERN DRIVE MECHANISM

Elmer C. Kiekhaefer, 2408 Cypress Gardens Rd., Winter Haven, Fla. 33880

Filed Feb. 23, 1978, Ser. No. 880,713
Int. Cl.³ B60F *3/00*
U.S. Cl. 440—59 **13 Claims**

1. In a stern drive mechanism for watercraft, a mounting bracket assembly for securement to the transom of a watercraft, said bracket assembly having a horizontal transverse bore therein rearwardly with respect to the transom, a drive unit having an upper housing and a lower housing, said upper housing including a horizontal cylindrical portion with one end of the cylindrical portion being rotatably received in the bore of the bracket assembly, and a bracket assembly addition having a horizontal bore for rotatably receiving the opposite end of the cylindrical portion and being secured to the bracket assembly, said bracket assembly and the addition thereto serving to rotatably support the drive unit and providing for tilt movement of said unit on a horizontal transverse axis relative to the transom, said upper housing further including a downwardly extending portion generally normal to the horizontal



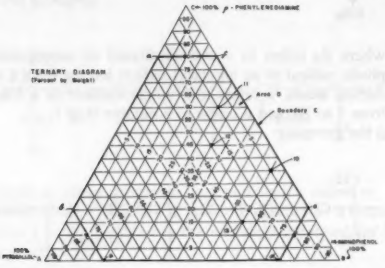
cylindrical portion, said downwardly extending portion of said upper housing and said lower housing being telescoped one within the other and being threadedly engaged to provide a dirigible connection therebetween for support of the lower housing and to provide for pivotal movement of the lower housing relative to the upper housing whereby to provide for steering control of the watercraft.

4,297,098

METHOD FOR GRADUAL COLORING OF HAIR TO A LIGHT BROWN SHADE AND PREPARATIONS FOR USE THEREIN

George F. Dasher, Inverness, and Thomas J. Schamper, Chicago, both of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Filed Aug. 26, 1976, Ser. No. 718,019
Int. Cl.[3] A61K 7/13
U.S. Cl. 8—412 4 Claims



1. A preparation for gradual coloring of living human hair to a light brown shade by air oxidation, comprising an aqueous carrier containing from 0.1 to 0.6 percent by weight based on the weight of the preparation of an oxidative dye combination, said dye combination consisting essentially of a mixture selected from the group consisting of (a) the mixture of p-phenylenediamine, pyrogallol, and m-aminophenol, and (b) the mixture of (a) in which p-toluenediamine is substituted on a molar equivalent basis for p-phenylenediamine, the said components of (a) being present in said mixture in the relative weight percents defined by the points within Area F of FIG. 2 including the points falling on Boundary G, or as further defined in (b) with respect to the substitution of p-toluendiamine for p-phenylenediamine, said preparation being free of oxygen prior to application to the hair and being capable of undergoing a progressive light brown color forming reaction on contact with atmospheric oxygen.

4,297,099

PROCESS FOR THE PRODUCTION OF A SYNTHETIC RESIN SHEET MATERIAL WHICH IS DYED UNICOLORED OR MULTICOLORED IN ACCORDANCE WITH A PATTERN

Manfred Simon, Nieder-Kassel; Erwin Möschter, Neunkirchen Seelscheid; Karl-Heinz Spiess, Konigswinter, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 961,012
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750984
Int. Cl.[3] D06P 5/02
U.S. Cl. 8—484 27 Claims

1. A process for the production of a synthetic resin sheet material having a unicolored or multicolored dye coating applied to at least a selective portion of one surface thereof, said dye coating penetrating uniformly into said sheet material, which comprises applying a dye-containing material to at least one selective portion of a surface of a synthetic resin sheet material, said synthetic resin sheet material containing at least one reactive, crosslinkable component that crosslinks with itself or with another crosslinkable component contained in said synthetic resin sheet material, and said dye-containing material being capable of migrating into a non-porous sheet formed of said synthetic resin sheet material; controlling the migration of the dye-containing material into the sheet material to a desired depth of penetration; then initiating crosslinking of said at least one crosslinkable component contained in said sheet material and crosslinking said at least one crosslinkable component to a different degree, within said synthetic resin sheet material, to stop further migration of the dye-containing material into said sheet material.

4,297,100

AQUEOUS DYE PREPARATIONS

Zdenek Koci, Binningen, and Hans Mollet, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 896,418, Apr. 14, 1978, abandoned.
This application Aug. 17, 1979, Ser. No. 67,584
Claims priority, application Switzerland, Apr. 19, 1977, 4808/77
Int. Cl.[3] D06P 1/52, 1/16, 1/10, 1/41
U.S. Cl. 8—527 9 Claims

1. A storage-stable aqueous dye preparation consisting essentially of, relative to the total amount of the preparation:

5 to 50 percent by weight of at least one water-soluble dye;

0.1 to 5 percent by weight of a dispersing agent;

0.1 to 30 percent by weight of at least one further additive, said further additive being an auxiliary selected from the group consisting of:

(a) glycine, 1-aminopropionic acid, 2-aminopropionic acid, betaine hydrate, choline, potassium glutamate, N-methyl glucamine, 2-amino-2-methyl-propanediol-1,3,2-amino-2-ethyl-propanediol-1, 3,tris-(hydroxymethyl)-aminomethane, and hydrolysed proteins having a molecular weight up to 10,000;

(b) ethylenediaminetetraacetic acid, nitrilotriacetic acid, N-hydroxyethyl-ethylenediaminetriacetic acid, diethylenetriaminepentaacetic acid, N,N-(dihydroxyethyl)-glycine, N-(hydroxyethyl)-iminodiacetic acid, amino-tri-(methylenephosphonic acid), 1-hydroxyethane-1,1-diphosphonic acid, α-aminoethanediphosphonic acid, methylenediphosphonic acid, ethylenediphosphonic acid, and the Na, K, NH_4, Li, mono-, di- and triethanolammonium salts thereof;

(c) maltose, saccharose-monolaurate, adducts of 1 mol of methyl glucoside with 5 to 20 mols of ethylene oxides, and xanthane gum;

(d) potassium salts, lithium salts, ammonium salts, choline salts, and amine salts optionally substituted by lower alkyl or hydroxy-lower-alkyl, of lactic acid, α-hydroxyisobutyric acid, gluconic acid, glycolic acid, pyrrolidone-2-carboxylic acid, pyridine-3-carboxylic acid, and pyridine-2,6-dicarboxylic acid;

0.5 to 30 percent by weight of at least one water-soluble anionic polyelectrolyte which is a synthetic polymerisation product containing carboxyl groups, having a molecular weight of 400 to 300,000, and is selected from the group consisting of (a) homopolymers of α, β-ethylenic unsaturated monocarboxylic acids or polyvalent carboxylic acids or their anhydrides, which have been subsequently saponified, (b) co- and ter-polymers of α, β-ethylenic unsaturated monocarboxylic acids or polyvalent carboxylic acids or anhydrides thereof, or co- and ter-polymers of α,β-ethylenic unsaturated monocarboxylic acids or polyvalent carboxylic acids or anhydrides thereof with other polymerisable monomers selected from unsaturated aliphatic or aromatic hydrocarbons, vinyl ethers, vinyl esters, methacrylic acid alkyl esters and unsaturated glyceride oils and diene polymers, and (c) homopolymers of (a) or co- and terpolymers of (b) which are substituted by hydroxyl groups, aldehyde groups, or hydroxyl groups and aldehyde groups;

and water to make up the remainder of the preparation.

4,297,101

PROCESS FOR THE DYEING OF SYNTHETIC POLYAMIDE FIBERS WITH REACTIVE DYES ACCORDING TO THE BATCHWISE EXHAUSTION METHOD

Hans-Ulrich von der Eltz, Frankfurt am Main; Armand Lehinant, Offenbach; Joachim W. Lehmann, Kelkheim, and Hans-Peter Maier, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 64,775, Aug. 8, 1979, abandoned. This application Jun. 13, 1980, Ser. No. 159,443

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2834997

Int. Cl.[3] **D06P** *3/82*

U.S. Cl. 8—531 **4 Claims**

1. In a process for the dyeing of a textile consisting of or containing synthetic polyamide fibers, with reactive dyes according to the batchwise exhaustion method, the improvement which comprises contacting the textile with an aqueous dye liquor containing one or more water-soluble reactive dyes, the initial pH value of said dye liquor being in the slightly acid to neutral range, for a time of from 5 to 30 minutes while maintaining the temperature of said liquor in the range of from 105° to 140° C., without the addition of an alkali or alkali-yielding agent and without the addition of an acid or acid-yielding agent.

4,297,102

CYCLICAL TENSIO-ACTIVE POLYETHERS

Guy Vanlerberghe, Claye-Souilly, and Henry Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

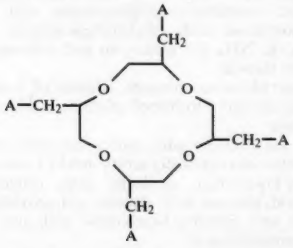
Filed Mar. 15, 1979, Ser. No. 20,656

Claims priority, application France, Mar. 17, 1978, 78 07914

Int. Cl.[3] **C07D** *323/00*

U.S. Cl. 8—406 **28 Claims**

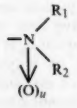
1. Cyclical tensio-active polyethers of the general formula:



(I)

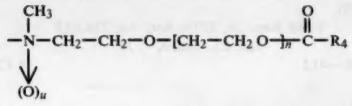
in which A is an amphiphile grouping selected from the group consisting of:

(a) the grouping:



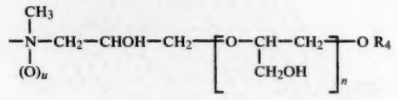
where R_1 and R_2, identical or different, refer to aliphatic radicals having from 1 to 20 carbon atoms, with one of the radicals including at least 8 carbon atoms, or substituted aliphatic radicals having from 6 to 20 carbon atoms, or alkylaryl radicals having from 6 to 20 carbon atoms, the sum of the carbon atoms of R_1 and R_2 being less than or equal to 28, or one of the radicals refers to a dimethylamino-ethyl or -propyl radical, diethylamino-ethyl or -propyl radical, piperidino -ethyl or -propyl radical, morpholino-ethyl or -propyl radical or alkyl polyhydroxy propylene radical, and u refers to the number zero or 1;

(a_1) the grouping:



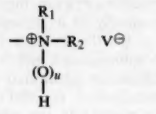
where R_4 refers to a non-substituted or substituted aliphatic radical or an alkylaryl radical having from 6 to 20 carbon atoms, n refers to a whole number or a fraction from 1 to 20, and u refers to a number 0 or 1;

(a_2) the grouping:

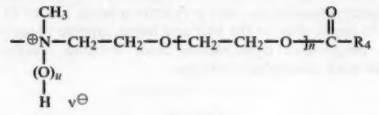


where u, R_4 and n having the meaning indicated above;

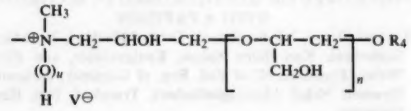
(b) the grouping:



(b_1) the grouping:

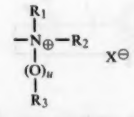


(b_2) the grouping:



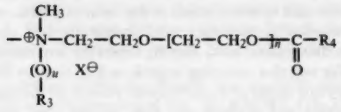
where in the groupings (b), (b_1), and (b_2) $V^{\ominus}$ refers to a formiate, acetate, citrate or lactate anion, and u, n, R_1, R_2 and R_4 have the meanings indicated for the groupings a and a_1;

(c) the grouping:

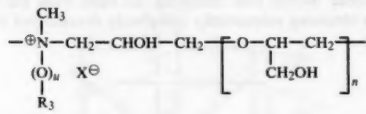


where R_1, R_2 and u having the meaning indicated for the grouping (a), R_3 refers to an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms or to a benzyl radical, and $X^{\ominus}$ refers to a chloride, bromide, iodide, monomethyl sulphate, methyl sulphonate or p.toluene sulphonate anion;

(c_1) the grouping:



(c_2) the grouping:



where in these groupings (c_1) and (c_2) u refers to the number 0 or 1, n refers to a whole number or a fraction from 1 to 20, and R_4 has the meanings indicated for the grouping (a_1);

(d) the grouping:

where $Q^{\ominus}$ refers to one of the following groupings:

$-(CH_2)_m-COO^{\ominus}$

where m refers to 1, 2, or 3,

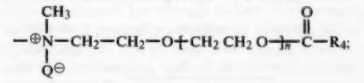
$-CH_2-CH_2-CH_2-SO_3^{\ominus}$,

or

$-CH_2-CH_2-O-SO_2^{\ominus}$

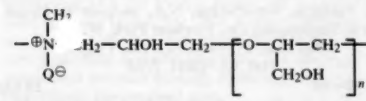
and R_1 and R_2 have the meaning indicated for the grouping (a);

(d_1) the grouping:



and

(d_2) the grouping:



where in groupings (d_1) and (d_2) n refers to a whole number or a fraction from 1 to 20 and $Q^{\ominus}$ has the meaning indicated for grouping (d).

27. A dye composition for the hair containing in an water or water-alcohol solution at least one polyether of claim **1** and one or more dyes selected from the group consisting of anthraquinone dyes, azoic dyes, nitrobenzene dyes, indoaniline dyes, indophenol dyes, and indamine dyes in an amount of 0.001 to 1% by weight of said dye composition.

4,297,103

PROCESS FOR THE CONTINUOUS ONE-BATH DYEING OF PILE FABRICS MADE OF POLYACRYLONITRILE/COTTON

Udo-Winfried Hendricks, Odenthal, and Klaus Wollny, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1979, Ser. No. 88,680

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849667

Int. Cl.[3] **D06P** *3/87*

U.S. Cl. 8—534 **4 Claims**

1. In the continuous one-bath dyeing of a pile fabric composed of a cotton base and an acrylic pile comprising padding the fabric with a dyebath containing a basic dyestuff and a substantive dyestuff, and thereafter steaming the fabric to effect dyeing, the improvement which comprises including in the dyebath a nitrile which swells the acrylic fiber and a salt of an alkyl sulphate of the formula

$$R'-O-SO_3^{\ominus}M^{\oplus}$$

in which

R' is alkyl with 10 to 16 carbon atoms, and

M is an alkali metal, alkaline earth metal, ammonium, alkylammonium or hydroxyalkylammonium ion.

4,297,104

METHOD OF DETECTING OR IDENTIFYING VIRUS ANTIGENS, ERYTHROCYTE OR CELL ANTIGENS OR ANTIBODIES IN A BIOLOGICAL MEDIUM

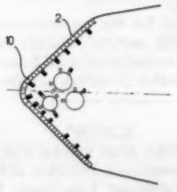
Matte Claude, Paris, France, assignor to Centre National de Transfusion Sanguine, France

Filed Feb. 23, 1979, Ser. No. 14,547

Claims priority, application France, Feb. 28, 1978, 78 05758

Int. Cl.[3] **G01N** *33/54, 33/80*

U.S. Cl. 23—230 B **33 Claims**

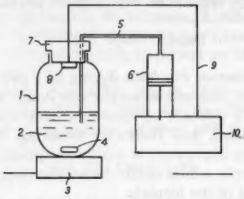


1. A method of analysing a biological medium to detect or identify virus antigens or erythrocyte or cell antigens or antibodies in the medium, the method involving immunological reactions between cells or particles, a serum and an antiglobulin, the reaction of analysis being conducted in a vessel the wall of which has a point of convergence or apex situated on the axis of symmetry of the vessel, wherein molecules of a reactant capable of immunologically reacting with the antiglobulin are fixed on the walls of the vessel, said antiglobulin being chosen for its capacity to immunologically and independently bind the cells or particles characterizing either positive or negative reaction with said molecules of reactant, then subjecting the reaction medium to a centrifugal force substantially parallel to said axis under conditions such that in a first period all the cells or particles, whether they characterize a reaction with a positive result or a negative result, progressively stick to and remain stuck to the wall of the vessel, the centrifugal force in said first period being such as to prevent a collection of said particles at the apex of the vessel, and then in a second period, only the cells or particles characterizing one kind of reaction remain stuck to the wall of the vessel whereas the cells or particles characterizing the other kind of reaction are collected at the apex of the vessel.

4,297,105
AUTOMATIC PHOTOMETRIC TITRATOR

Ghyslain Dube, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Jun. 27, 1980, Ser. No. 163,701
Int. Cl.³ G01N *21/76, 31/16*
U.S. Cl. 23—230 R **12 Claims**



1. A method for detection of end-point in acid-base titration reactions to determine acid in an acid-containing material, said method comprising placing a quantity of a chemiluminescent indicator together with a sample of the acid-containing material to be analyzed into a vessel, gradually adding a suitable basic titrant to the vessel whilst monitoring by means of a light detector the intensity of light emission from the indicator, obtaining the first derivative with respect to time of the output signal of the light detector and detecting when the first derivative of the output signal reaches an amplitude level indicative of the acid-base reaction end-point.

4,297,106
RAPID METHOD FOR THE MEASUREMENT OF IODINE VALUE

Akira Makino, Yokosuka, Japan, assignor to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,427
Claims priority, application Japan, Aug. 2, 1979, 54/98127
Int. Cl.³ G01N *31/00*
U.S. Cl. 23—230 HC **3 Claims**

1. A rapid method for the measurement of iodine value according to the Wijs method wherein reaction is greatly reduced by means of a catalyst selected from the group consisting of magnesium acetate or sodium acetate.

4,297,107
FUELS AND THEIR USE

Günther Boehmke, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,122
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854540
Int. Cl.³ C10L *1/18, 1/22*
U.S. Cl. 44—51 **12 Claims**

1. A fuel for a combustion engine consisting essentially of a hydrocarbon, water and a non-ionic emulsifier, said non-ionic emulsifier consisting essentially of the addition product of ethylene oxide or propylene oxide and a carboxylic acid amide with 9 to 21 carbon atoms, said non-ionic emulsifier being present in said fuel in an amount of 0.5 to 6% by weight.

4,297,108
DESULFURIZATION OF COAL

Carl Horowitz, and Michael Dichter, both of Brooklyn, N.Y., assignors to Polymer Research Corp. of America, Brooklyn, N.Y.

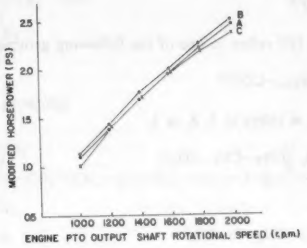
Continuation-in-part of Ser. No. 904,505, May 10, 1978, abandoned. This application Apr. 22, 1980, Ser. No. 142,828
Int. Cl.³ C10L *9/02*
U.S. Cl. 44—1 SR **10 Claims**

1. Method of removing organic sulfur from coal from which the main portion of pyritic sulfur has been removed by froth flotation but which still contains sulfur mainly in the form of organic sulfur and to some extent in the form of pyritic sulfur, which comprises treating such coal containing said organic sulfur with dilute nitric acid, thereby oxidizing any remaining pyritic sulfur and also oxidizing organic sulfur, thereby solubilizing the pyritic sulfur and a substantial portion of the organic sulfur, filtering and washing the thus treated coal, thereby removing the solubilized sulfur and nitric acid therefrom, and treating the thus obtained coal still containing organic sulfur with an unsaturated hydrocarbon which binds remaining organic sulfur thereto thus removing the same from the coal, thereby obtaining substantially completely desulfurized coal.

4,297,109
FUEL COMPOSITION

Kazuo Sugito, Kashihara, and Sakuzo Takeda, Tsu, both of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jul. 2, 1980, Ser. No. 165,267
Claims priority, application Japan, Jul. 4, 1979, 54/85436
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—56 **11 Claims**



1. A composition useful as a fuel, said composition comprising an admixture of gasoline and a vegetable oil containing 1,8-cineole as a major component, said gasoline and said vegetable oil being admixed in amounts effective for forming fuel having a ratio of gasoline to said vegetable oil of 95:5 to 5:95 by volume.

4,297,110
ZIRCONIUM ADDITIVES FOR RESIDUAL FUEL OIL

Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 31, 1980, Ser. No. 135,994
Int. Cl.³ C01L *1/18*
U.S. Cl. 44—66 **15 Claims**

1. A process for the combustion of a residual fuel oil comprising the steps of:

(a) dissolving in said fuel oil an effective trace amount of an additive consisting essentially of a zirconium salt of a carboxylic acid selected from the group consisting of C_4–C_{22} linear or branched fatty acids, tall oil, naphthenic acid, or mixture thereof, said amount being effective in reducing the amount of particulate matter formed during combustion; and

(b) combusting said resulting fuel oil.

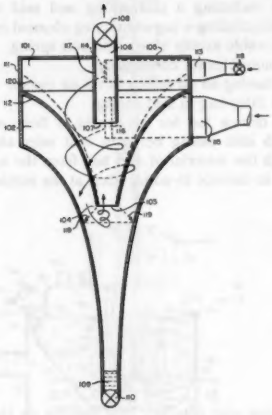
4,297,111
PROCESS AND APPARATUS FOR THE CONTACT AND SEPARATION OF IMMISCIBLE FLUIDS

Leon I. Ross, Grand Cayman, Cayman Islands, assignor to Caribbean Properties Limited, Grand Cayman, Cayman Islands

Continuation of Ser. No. 76,676, Sep. 19, 1979, abandoned, which is a continuation of Ser. No. 878,389, Feb. 16, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,841

Int. Cl.³ B01D *47/16, 47/18*

U.S. Cl. 55—92 **38 Claims**



26. A process for the continuous contact of a liquid feed with a less dense fluid feed and the subsequent separation of a resultant fluid product from a less dense immiscible fluid product, the process comprising:

(a) directing a denser liquid feed into and axially through a first conduit, having a generally circular transverse cross-section surrounding a central longitudinal axis, into an overlapping coaxial second conduit, the second conduit also having a generally circular transverse cross-section overlapping the outlet from the first conduit, and defining a generally annular passage between the interlapped walls of the coaxial first and second conduits,

(b) spinning the denser liquid feed emerging from the generally circular outlet of the first conduit around the longitudinal axis thereof fast enough to form the emerging denser liquid into a generally continuous spinning liquid curtain connecting the rim of said first conduit outlet directly with the overlapping wall of the second conduit, thereby curtaining off the annular passage between the interlapped walls of the coaxial conduits,

(c) directing a less dense fluid feed into and through said annular passage axially and into and through the spinning curtain, the liquid and less dense fluid feeds consequently interacting with one another within the second conduit to yield spinning immiscible fluid products differing in density from one another; two immiscible spinning fluid products separating centrifugally from one another, the less dense fluid product flowing relatively radially inwardly towards the longitudinal axis,

(d) withdrawing the less dense fluid product from a location relatively near the longitudinal axis; and

(e) separately withdrawing the denser fluid product from the second conduit.

32. An apparatus for the continuous contact of a denser liquid feed with a less dense fluid feed and the subsequent separation of a resultant denser fluid product from a less dense immiscible fluid product, the apparatus comprising:

(a) a first conduit, having a generally circular transverse cross-section and a central longitudinal axis, the conduit being open at one end to provide an outlet having a circular rim, centered upon the longitudinal axis of the conduit and located in a plane generally perpendicular thereto,

(b) a second conduit, coaxial with and overlapping the first conduit, the second conduit also having a generally circular transverse cross-section and extending axially beyond the rim of the first conduit, the first and second conduits defining a generally annular passage between the interlapped portions, the annular passage having an outlet into the second conduit defined by the rim of the first conduit,

(c) means for introducing a denser liquid feed into the first conduit and for directing the flow of the denser liquid feed through the first conduit axially toward and into the overlapping coaxial second conduit,

(d) means for causing the denser liquid feed to spin about the longitudinal axis of the conduit as the liquid emerges from the outlet of the first conduit fast enough to form the emerging denser liquid into a generally continuous spinning fluid curtain connecting the rim of the said first conduit outlet with the overlapping second conduit, thereby curtaining off the outlet from the annular passage between the interlapped coaxial conduits,

(e) means for introducing a less dense fluid feed into and through the annular passage between the interlapped walls of the coaxial conduits and into the second conduit, so as to intercept the spinning denser fluid curtain,

(f) an outlet for the less dense fluid product located relatively near the longitudinal axis; and

(g) separate outlet for the denser fluid product from the second conduit.

4,297,112
DEODORIZATION OF EDIBLE OILS

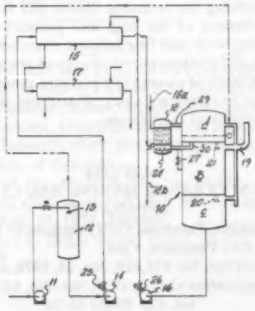
Leonard Naylor, Hull, England, assignor to Simon-Rosedowns Limited, Hull, England

Filed Nov. 19, 1979, Ser. No. 95,359

Claims priority, application United Kingdom, Dec. 1, 1978, 46896/78

Int. Cl.³ B01D *53/00*

U.S. Cl. 55—195 **9 Claims**



1. A semi-continuous deodoriser comprising a vessel divided into three zones, means for collecting oil to be deodorised in the first zone, means for transferring oil from said first zone to said second zone and means for deodorising oil in the second zone and means for receiving and holding deodorised oil from the second zone in the third zone, means for passing oil continuously to the first zone and withdrawing deodorised oil continuously from the third zone, means for pre-heating the oil to be fed to the first zone by heat exchange with oil from the third zone, means for heating said pre-heated oil to full process temperatures in said first zone prior to transferring it to said second zone comprising oil heating means connected to receive said preheated oil, and means for recirculating the oil through said oil heating means and through said first zone

comprising oil flow passages interconnecting said oil heating means and said first zone to provide a recirculation circuit and means for introducing a motive gas effectively under pressure into said circuit.

4,297,113

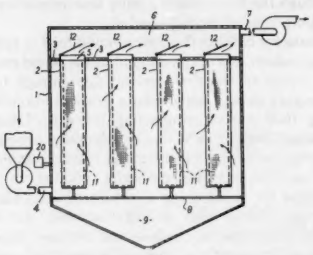
GAS FILTRATION APPARATUS

Louis Theodore, 51 Maple Dr., New Hyde Park, N.Y. 11040

Filed Mar. 3, 1980, Ser. No. 126,553

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—213 **5 Claims**



1. Apparatus, for removing particulate material from a gas stream, comprising a housing having inlet means and outlet means, a plurality of gas-permeable hollow mesh filter bags supported in said housing and serving to partition the interior of the housing into a first chamber communicating with the inlet means and a second chamber communicating with the outlet means, the interior of all of said filter bags communicating through means defining respective openings with said second chamber, a respective closure for the opening of each filter bag, said closure being a plate hingedly mounted to means defining said opening and responsive to a predetermined increase of gas velocity through the opening, as a result of rupture of the filter bag, to close the opening, a cord attached between the plate and retaining means mounted adjacent to the plate, said retaining means releasably retaining the cord responsive to gas flow and non-rupture of the bag, means on said cord for receiving the retaining means and for releasing the cord upon rupture of the bag, and pressure-sensing means communicating with said first housing chamber and arranged, upon sensing of a predetermined change of pressure in said first chamber as a result of closing of a predetermined proportion of said openings to terminate entry of said gas stream into said housing through said inlet means.

4,297,114

VACUUM CLEANER HAVING BAG CLEANING APPARATUS

Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Co., Pasadena, Calif.

Continuation of Ser. No. 871,819, Jan. 24, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,595

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—299 **28 Claims**

1. A vacuum cleaner comprising:

a casing having an air inlet and an air outlet;

a flexible filter bag in said casing;

a motor driven fan for producing a flow of suction air through said casing between said inlet and outlet and through the material of said bag from the exterior of the bag to its interior to collect dust at the outside of the bag;

a bag cleaning rotor mounted within said bag to turn about an axis and against which the bag is constricted inwardly by said flow of suction air when the fan is in operation; and

means for turning said rotor about said axis;

said rotor having at least one arm which projects outwardly away from said axis in an extended position of the arm when the rotor is turned while the fan is not in operation, and which has a radially outer portion acting in said extended position of the arm to contact the inside of the bag as the rotor turns and displace dust from the exterior thereof;

said arm being constructed to flex longitudinally in a relation swinging said outer portion thereof from said extended position inwardly toward said axis to a position substantially reducing the effective diameter of the rotor, under the influence of force exerted inwardly by the bag when constricted by said flow of suction air;

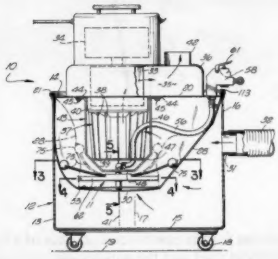
said arm including a coil spring and said outer portion thereof including a bag contacting element received about and movable axially along said coil spring.

2. A vacuum cleaner comprising:

a casing having an air inlet and an air outlet;

a flexible filter bag in said casing;

a motor driven fan for producing a flow of suction air through said casing between said inlet and outlet and through the material of said bag from the exterior of the bag to its interior to collect dust at the outside of the bag;



a bag cleaning rotor mounted within said bag to turn about an essentially vertical axis and against which the bag is constricted inwardly by said flow of suction air when the fan is in operation;

means for turning said rotor about said axis;

said rotor having at least one arm which projects outwardly away from said axis in an extended position of the arm when the rotor is turned while the fan is not in operation, and which has a radially outer portion acting in said extended position of the arm to contact the inside of the bag as the rotor turns and displace dust from the exterior thereof;

said arm being constructed to flex longitudinally in a relation swinging said outer portion thereof from said extended position inwardly toward said axis to a position substantially reducing the effective diameter of the rotor, under the influence of force exerted inwardly by the bag when constricted by said flow of suction air; and

a member within the bag at a location beneath said rotor and acting to limit constriction of the lower portion of the bag.

4,297,115

BAG-TYPE FILTER WITH AIR DIFFUSER TUBES OF HELICAL CONSTRUCTION

Allen S. Johnson, Jr., Salisbury, N.C., assignor to Staclean Diffuser Company, Salisbury, N.C.

Continuation-in-part of Ser. No. 76,605, Sep. 18, 1979, Pat. No. 4,231,770. This application Aug. 18, 1980, Ser. No. 178,847

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—302 **10 Claims**

1. In a filter apparatus of the type wherein a particulate-laden gas is directed through a tubular filter bag for filtering and retaining the particulate material on the exterior of the bag, and wherein the filter bag is cleaned by a periodic reverse purge of air into the bag, said filter bag having an outlet end for

discharge of the filtered gas and being supported by a tubular supporting cage positioned within said filter bag, the combination therewith of

a hollow air diffuser tube formed from a perforated strip of helically wound sheet metal and extending longitudinally within said tubular supporting cage, and wherein adjacent edges of said strip are interconnected by a seam in which said adjacent edges overlap each other in interlocking relationship and with said seam thus extending helically

around said air diffuser tube, and said tube being in communication with said outlet end of said filter bag for receiving a reverse purge of air therein for diffusing and distributing the air throughout said filter bag when a periodic reverse purge of air is directed into the outlet end of the filter bag so as to more effectively clean the filter bag while also reducing excessive flexing of the filter bag and abrasive wear thereof to thereby provide a substantial increase in the efficiency of the filter apparatus and a significant increase in the life of the filter bag.

4,297,116

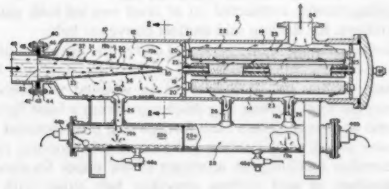
APPARATUS FOR SEPARATING FOREIGN MATTER FROM A GAS STREAM

Kenneth M. Cusick, Amarillo, Tex., assignor to Aitken, Inc., Houston, Tex.

Continuation of Ser. No. 922,904, Jul. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 754,366, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 598,566, Jul. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 572,352, Apr. 28, 1975, abandoned. This application Jan. 31, 1980, Ser. No. 117,045

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—319 **15 Claims**



1. A separator for receiving an incoming contaminated gas stream containing foreign suspended particles therein, comprising:

(a) an elongate vessel defining a chamber having an inlet for receiving said contaminated gas stream and an outlet for discharging gas substantially free of said foreign particles;

(b) an imperforate wall in said chamber between said inlet and said outlet for dividing said chamber into a separate gravity chamber having said inlet and a separate filter chamber having said outlet, said wall having at least one port therethrough;

(c) a conical strainer-diffuser member disposed inside said gravity chamber and connected relative to said inlet to receive contaminated gas flow therefrom, said strainer-diffuser member having:

(1) a conical side wall forming a conical bore tapering inwardly relative to the direction of contaminated gas flow from said inlet, said conical side wall having a plurality of spaced holes extending transversely therethrough, said holes having a diameter ranging between 1/16 inch to ⅛ inch and opening in multiple radial directions from said conical bore within said gravity chamber;

(2) an open front end substantially coextensive with said inlet to said vessel, and connected relative thereto for said front end to receive all of the incoming contaminated gas;

(3) said holes in said conical side wall forming substantially the only exit for said contaminated gas entering said gravity chamber, said holes having a total area greater than the area of said inlet and having inner edge portions protruding inwardly into said conical bore and forming barriers around the inner edges of said holes, damming the flow of liquid particles over the inner surface of said conical side wall and through said holes, causing said liquid particles to form large drops which are subsequently jetted outside of said diffuser member through said holes with said gas and into said gravity chamber, most of the jetted-out large liquid drops falling to the bottom of said gravity chamber; and

(d) at least one filter element disposed in said filter chamber and with said filter element in communication with said port in said chamber dividing wall for receiving the gas stream from said gravity chamber and filtering out fine foreign particles from gas passing through said filter element so that substantially particle free gas will exit from said outlet of said vessel.

4,297,117

RESPIRATORY DEVICE FOR CATASTROPHIC FIRES AND/OR SMOG WEATHER CONDITIONS

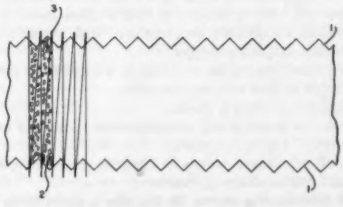
Heinz Holter, Gladbeck; Heinz Gresch, Dortmund-Derne, and Heinrich Igelbuscher, Gladbeck, all of Fed. Rep. of Germany, assignors to Industrie-Wert Beteiligungsgesellschaft mbH, Mainz, Fed. Rep. of Germany

Filed Jun. 19, 1979, Ser. No. 50,277

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827115; Aug. 28, 1978, 2837469

Int. Cl.³ B01D *39/14, 53/04, 53/22*

U.S. Cl. 55—389 **11 Claims**



1. A respiratory filter element for catastrophic fires and/or smog weather conditions characterized by a fleece-like material that is reinforced with adsorption materials comprising soda lime, active carbon dust, and either copper dust or manga-

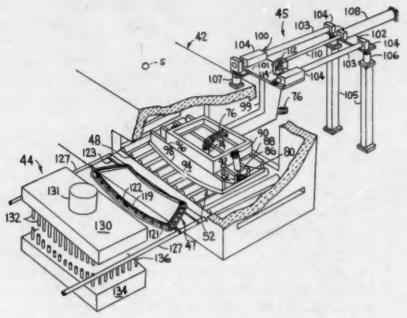
nese dioxide dust or both copper dust and manganese dioxide dust, and thus characterized in that the adsorption material is deposited on a base material made of expanded calcium-aluminum-silicate and that the base material is embedded in the fleece-like material.

4,297,118

CONTROLLING OVERHEATING OF VACUUM MOLD USED TO SHAPE GLASS SHEETS

John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 18, 1980, Ser. No. 131,337
Int. Cl.³ C03B *25/035*
U.S. Cl. 65—104 **10 Claims**



1. A method of shaping a glass sheet, comprising the steps of:
supporting a heated sheet on support means in a shaping chamber having a heated interior, the sheet heated to approximately its shaping temperature;
transferring the heated sheet in the shaping chamber to shaping means to remove the sheet from the support means;
shaping the sheet in the shaping chamber by way of the shaping means;
transferring the shaped sheet from the shaping means to transfer means, said transferring step practiced in the shaping chamber;
advancing the shaped sheet on the transfer means out of the shaping chamber;
cooling the shaped sheet;
removing the shaping means out of the shaping chamber into an environment cooler than the heated interior of the shaping chamber to permit cooling of the shaping means; and
practicing said removing step before practicing said transferring the heated sheet step, shaping step and transferring the shaped sheet step for next subsequent heated sheet on the support means in the shaping chamber.

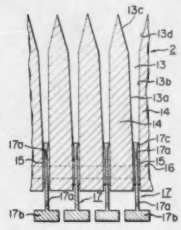
4. An apparatus for shaping a glass sheet, comprising:
elongated heating means to heat a glass sheet to approximately its shaping temperature, said means including a heated shaping chamber;
first advancing means to advance a sheet from said heating means to said shaping chamber;
means for shaping a sheet;
means for moving said shaping means into and out of said heated shaping chamber;
second advancing means to advance a shaped sheet out of said heated shaping chamber;
first transferring means to transfer a sheet from said first advancing means to said shaping means;
second transferring means to transfer a sheet from said shaping means to said second advancing means;
means responsive to the movement of a said first advancing means for actuating in succession said shaping means, said first transferring means and said second transferring means to move a sheet from said first advancing means to said shaping means, to shape a sheet and to transfer a sheet from said shaping means to said second transferring means;
means for actuating said moving means to move said shaping means out of the shaping chamber after the shaped sheet is transferred to said second advancing means; and
means for activating said second advancing means to move said second advancing means out of said shaping chamber.

4,297,119

APPARATUS FOR VITRIFYING BLAST FURNACE SLAG

Ryo Ando, and Kazuyoshi Sato, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,055
Int. Cl.³ C03B *5/23*
U.S. Cl. 65—141 **12 Claims**



1. An apparatus for vitrifying blast furnace slag, comprising:
an endless conveyor belt including a pair of pulleys, said conveyor belt being formed by endlessly connecting a plurality of rectangular cooling metal members, each of said plurality of cooling metal members being of high thermal conductivity and having, on the outer surface thereof, a plurality of elongated narrow and deep cooling grooves, the longitudinal directions of said cooling grooves being substantially in parallel with the travelling direction of said endless conveyor belt, each of said plurality of cooling grooves comprising an outwardly flaring inlet section for receiving a molten blast furnace slag and an inwardly narrowing cooling section, following said inlet section, for rapidly cooling and solidifying the molten blast furnace slag into a vitreous blast furnace slag, said cooling section of each of said cooling grooves having a top end maximum width within the range of from 3 to 10 mm and a depth within the range of from 2 to 20 times said top end maximum width so as to cool the molten blast furnace slag under constraint to thereby produce a large internal strain in the vitrified blast furnace slag, the vitrified blast furnace slag being in the form of elongated sheets having a maximum thickness of 3 to 10 mm;
driving means, connected to at least one of said pair of pulleys, for driving said endless conveyor belt;
a molten slag container arranged above the upstream of the upper forwarding position of said endless conveyor belt, said molten slag container being adapted to receive a molten blast furnace slag discharged from a blast furnace and pour said molten blast furnace slag thus received into said plurality of cooling grooves of said cooling metal member reaching the upstream of the upper forwarding position of said endless conveyor belt along with the travel of said endless conveyor belt;
a stripper arranged, in the upstream of the lower returning position of said endless conveyor belt, at a prescribed position adjacent to the back surface of said endless conveyor belt, said stripper being adapted to take out a cooled

and solidified vitreous blast furnace slag in said plurality of cooling grooves of said cooling metal member; and,

a cooling means arranged at a prescribed position in the lower returning position of said endless conveyor belt, said cooling means being adapted to sequentially cool said cooling metal members heated by the high-temperature molten blast furnace slag poured into said cooling grooves after stripping the vitreous blast furnace slag.

4,297,120

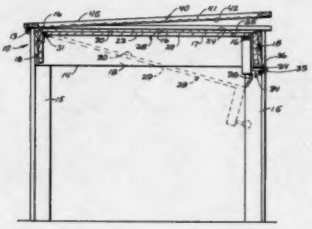
GLASS BENDING TABLE

Robert J. Smith, S. 1215 Mica Park Dr., Spokane, Wash. 99206; Mark A. Smith; Michael E. Jensen, both of S. 1922 Bannen, Veradale, Wash. 99216, and Robert L. Smith, N. 3950 McGuire Rd., Post Falls, Id. 83854

Filed Jul. 28, 1980, Ser. No. 172,994

Int. Cl.³ C03B *23/06*

U.S. Cl. 65—281 **10 Claims**



1. A table for supporting and insulating a flat forming pattern from heated glass tubing to be formed according to the pattern, comprising:

a frame;

a light transmitting plate mounted to the frame, said plate having a flat top surface and a parallel flat bottom surface;

pattern holding means mounted to the frame below the plate for releasably receiving and holding the flat pattern adjacent the flat bottom surface of said plate;

screen means supported on the flat top surface of the plate having a working surface thereon spaced above said flat top plate surface and defining an air space between the working surface and top plate surface;

wherein said screen means is adapted to support heated glass on its working surface for forming purposes according to a flat pattern viewable on said pattern holding means through the plate and screen means.

4,297,121

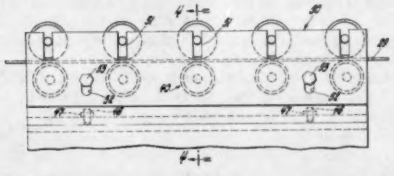
GLASS TEMPERING FURNACES AND SYSTEMS

Donald E. Rhonehouse, Cecil, Ohio, assignor to TGS Systems, Inc., Antwerp, Ohio

Filed May 29, 1979, Ser. No. 43,357

Int. Cl.³ C03B *27/00*

U.S. Cl. 65—348 **20 Claims**



1. A conveyor for a glass-tempering system having a supporting frame section, comprising:

a first elongated glass-supporting conveyor roller;

an upwardly-open roller support;

means mounting said roller support on a frame section;

a second roller rotatably mounted in said roller support with its axis parallel to that of said glass-supporting conveyor roller;

a driving belt extending between said first and second rollers within said roller support and operable to rotate said conveyor roller;

said second roller supporting said driving belt, with said driving belt vertically supporting said first conveyor roller above said second roller;

a roller guide supported upon said roller support;

a vertically-extending upwardly-open guide slot in said roller guide extending in the same vertical plane as the axis of said second roller and being directly above said axis;

said conveyor roller having a projecting axle-like pin received in said guide slot and freely movable vertically therein but restrained horizontally thereby, with said axle-like pin of said conveyor roller being in the same vertical plane as the axle of said second roller;

said roller guide having a portion defining a bottom for said slot;

said second roller being mounted beneath said conveyor roller at a distance with respect to the bottom of said guide slot such that said conveyor roller axle-like pin is maintained above and out of contact with said bottom of said slot;

said conveyor roller being removable by lifting upwardly out of said guide slot whereupon said belt can be removed from said second roller and through said upwardly open roller support; and

drive means for driving said belt.

4,297,122

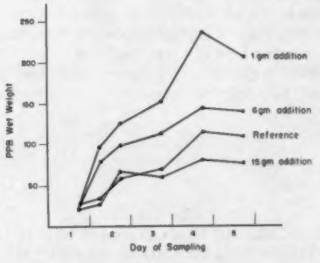
PROCESS FOR THE BIOLOGICAL DEGRADATION OF ORGANIC-CONTAINING WASTE MATTER

Christopher B. Wallace, Fitchburg, Mass., assignor to Bio-Group, Inc., Va.

Filed Apr. 18, 1979, Ser. No. 31,332

Int. Cl.³ C05F *7/00*; **C02F** *3/02*

U.S. Cl. 71—12 **11 Claims**



1. A biological degradation process for the treatment of organic-containing waste matter for producing a waste matter sludge material, the process containing a step for contacting microorganisms with the organic-containing waste matter, which comprises adding to the organic-containing waste matter a microbial activity and microbial population-enhancing concentration of a mineral composite consisting essentially of a naturally occurring glacial deposit comprising from about 4–48 wt. percent Si, 2–35 wt. percent Ca, 1–20 wt. percent Al, 1–15 wt. percent Fe, 0.5–12 wt. percent Mg, 0.1–8 wt. percent Na, 0.01–5 wt. percent K, 0.001–2 wt. percent Ti, 0.0005–2 wt. percent Mn, 0.0005–2 wt. percent P, 0.0005–1 wt. percent Ba and 0.0005–0.5 wt percent Zn, the mineral composite being in a biologically active size of below about 70% mesh size at 100 mesh, said concentration being below about 1 part by weight mineral composite per 15 parts by weight of organic matter

contained in the waste matter to be treated and above about 1 part by weight mineral composite per 400 parts by weight of organic matter.

4,297,123

METHOD AND APPARATUS FOR PRODUCING A NITRATE FERTILIZER

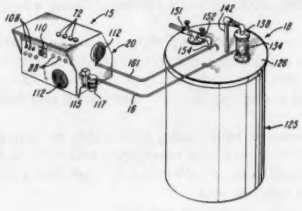
Harold G. Wyse, 3629 N. Dixie Dr., Dayton, Ohio 45414, and Millard S. Smith, 5625 W. Kochville Rd., Saginaw, Mich. 48604

Filed Feb. 7, 1980, Ser. No. 119,638

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.³ B01K *1/00*; C05C *5/00*

U.S. Cl. 71—58 **21 Claims**



1. A method adapted for efficiently producing a nitrate fertilizer, comprising the steps of forming an air combustion unit including a combustion chamber having a first electrode element defining a circular restriction aperture, arranging a second electrode element concentrically with said aperture, supplying an electrical voltage across said electrode elements to produce an electrical arc therebetween within the aperture, producing a spiral flow of air within the chamber and directing the flow through the restriction aperture at an increased velocity to effect rotation of the arc within the aperture and to assure the air is exposed to the arc for efficiently generating a nitrogen dioxide gas, and introducing the gas from the combustion chamber into a flow of water contained within a tank and being recirculated through an elongated absorption tube having substantial length to produce a nitric acid solution usable as a nitrate fertilizer.

4,297,124

N-TETRACHLORO-ETHYLTHIO-SUBSTITUTED HALOMETHANESULFONAMIDES AS AQUATIC WEED CONTROL AGENTS

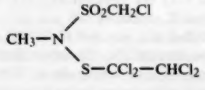
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 28, 1980, Ser. No. 115,586

Int. Cl.³ A01N *31/02*

U.S. Cl. 71—66 **2 Claims**

1. A method for controlling the growth of aquatic weeds comprising applying to said aquatic weeds or their growth environment an amount of the compound of the formula



effective to control the growth of said aquatic weeds.

4,297,125

TREE ROOTING USING SYNTHETIC AUXINS

Bruce E. Haissig, Rhinelander, Wis.; Jack R. Gaines, Rapid City, S. Dak., and Glen Giacoletto, Richland, Wash., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

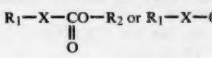
Filed Jun. 27, 1979, Ser. No. 52,656

Int. Cl.³ A01N *21/00*

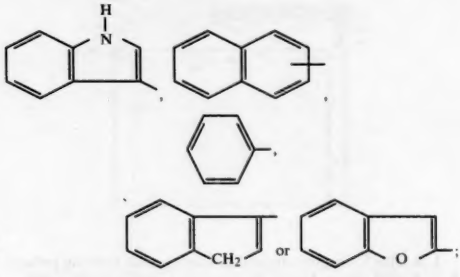
U.S. Cl. 71—77 **7 Claims**

1. A composition for stimulating adventitious root formation in difficult-to-root cuttings, comprising:

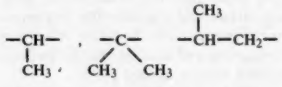
an amount sufficient to stimulate adventitious root formation of a compound of the formula



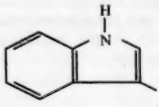
wherein R_1 is



X is $(CH_2)_n$ wherein n is 1–3,



or —O—CH_2—; and R_2 is phenyl or substituted phenyl, with the proviso that n is not 1 when R_1 is



and R_2 is phenyl; and a volatile or inert non-toxic carrier.

4,297,126

IMIDAZOLINYL BENZAMIDES AS PLANT GROWTH REGULANTS

Thomas D. O'Neal, Princeton, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Division of Ser. No. 868,090, Jan. 9, 1978, Pat. No. 4,201,565. This application Dec. 17, 1979, Ser. No. 103,898

Int. Cl.³ A01N *43/50*

U.S. Cl. 71—78 **2 Claims**

1. A method for eliminating and/or inhibiting bud growth on tobacco plants comprising, applying to the foliage of topped tobacco plants a bud growth inhibiting amount of the compound o-(5-isopropyl-5-methyl-4-oxo-2-imidazolin-2-yl)-N,N-dimethyl-benzamide.

4,297,127
HERBICIDAL USE OF 2,6-DINITROANILINE HERBICIDES

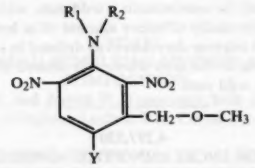
Albert W. Lutz, Princeton, and Robert E. Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 777,271, Mar. 11, 1977, Pat. No. 4,165,231, which is a continuation-in-part of Ser. No. 639,729, Dec. 11, 1975, abandoned, which is a division of Ser. No. 538,980, Jan. 6, 1975, Pat. No. 4,066,441, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Jan. 8, 1979, Ser. No. 1,660

Int. Cl.[3] A01N *43/84*

U.S. Cl. 71—88 **4 Claims**

1. A method for the preemergence control of undesirable plant species comprising applying to soil containing seeds of the undesirable plant species a herbicidally effective amount of a compound of the formula:



wherein:

Y represents CH_3, C_2H_5, n-C_3-H_7, i-C_3-H_7, sec-C_4H_9 or i-C_4H_9;

R_1 and R_2 taken together with the nitrogen to which they are attached represent morpholino, or dimethylmorpholino.

4,297,128
USE OF IMIDAZOLINYL BENZOATES AS HERBICIDAL AGENTS

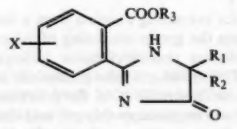
Marinus Los, Pennington, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Division of Ser. No. 914,244, Jun. 9, 1978, Pat. No. 4,188,487, which is a continuation-in-part of Ser. No. 822,458, Aug. 8, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 74,940

Int. Cl.[3] A01N *43/50*

U.S. Cl. 71—92 **25 Claims**

1. A method for the control of undesirable plant species comprising, applying to the foliage of the plants or to soil containing seeds, seedlings or propagating organs of the plants, a herbicidally effective amount of a compound having the structure:



wherein X is hydrogen, alkyl C_1–C_3, halogen or nitro; R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, phenyl, halophenyl or benzyl or when R_1 and R_2 are taken together with the carbon to which they are attached they may represent cycloalkyl C_3–C_6 optionally substituted with methyl; R_3 is hydrogen, alkyl C_1–C_{12} optionally substituted with one C_1–C_3 alkoxy group or one C_3–C_6 cycloalkyl group or one phenyl group or one furyl group, alkenyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituent(s) alkynyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituent(s), benzyl, cyclohexenylmethyl, ethynylcyclohexyl, ethynylalilyl or pentadienyl, cycloalkyl C_3–C_6 optionally substituted with one or two C_1–C_3 alkyl group(s); or a salt-forming cation of alkali metals, ammonium or C_1–C_{18} aliphatic ammonium; and when R_1 and R_2 are not the same the optical isomer thereof, or an isomeric mixture thereof; or except when R_3 is a salt-forming cation, the strong acid addition salt thereof.

4,297,129
3,5-DIOXO-1,2,4-TRIAZINES

Yuzuru Sanemitsu; Masato Mizutani; Seizo Sumida; Haruhiko Katoh, all of Hyogo; Hiromichi Oshio, Osaka, and Shunichi Hashimoto, Sonehigashimachi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

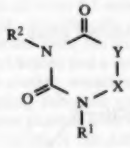
Filed Apr. 25, 1980, Ser. No. 143,549

Claims priority, application Japan, Apr. 27, 1979, 54-52968; Aug. 9, 1979, 54-102074; Aug. 17, 1979, 54-105442; Aug. 17, 1979, 54-105443; Aug. 20, 1979, 54-106482; Oct. 30, 1979, 54-140915; Nov. 1, 1979, 54-142539; Nov. 5, 1979, 54-143551; Dec. 7, 1979, 54-159455; Dec. 13, 1979, 54-162305; Dec. 19, 1979, 54-166240; Jan. 14, 1980, 55-2958; Jan. 24, 1980, 55-7544

Int. Cl.[3] C07D *253/06*; A01N *43/64*

U.S. Cl. 71—93 **20 Claims**

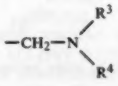
1. A herbicidal composition which comprises as an active ingredient at least one of the 3,5-dioxo-1,2,4-triazine derivatives of the formula:



(I)

wherein

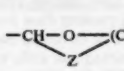
(1) (a) —X—Y— represents —N=CH—, (b) R^1 is a hydrogen atom, a hydroxylmethyl group, an aminomethyl group of the formula:



(in which R^3 and R^4 are each hydrogen, C_1–C_{12} alkyl, allyl, propargyl, cyanoethyl, phenyl or C_3–C_{10} cycloalkyl or, when taken together with the adjacent nitrogen atom, represent a 3 to 13-membered saturated nitrogen-containing heterocyclic group optionally containing an oxygen atom or an additional nitrogen atom and/or optionally bearing not more than three methyl or ethyl groups), an acyloxymethyl group of the formula:

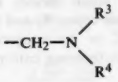
$$—CH_2—OOC—R^5$$

(in which R^5 is C_1–C_9 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl or cyclohexyl, these R^5 groups being optionally substituted with not more than five halogen, C_1–C_5 alkoxy, phenyl or phenoxy groups, or phenyl, naphthyl, nicotinyl or isonicotinyl, these being optionally substituted with not more than five methyl, methoxy, halogen, nitro or trihalomethyl groups or with 3,4-methylenedioxy) or a cyclic ether group of the formula:

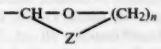


(in which Z is —CH_2CH_2— and m is an integer of 1 or 2

or Z is —CHX'CH$_2$—, —CHX'CHX'— or —CH=CH— (X' being halogen) and m is 1) and (c) R^2 is a hydrogen atom, an aminomethyl group of the formula:



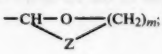
(in which R^3 and R^4 are each as defined above) or a cyclic ether group of the formula:



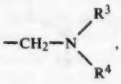
(in which Z' is —CH_2CH_2— and n is an integer of 1 or 2 or Z is —CHY'CH_2— (Y' being halogen) and n is 1), provided that when R^2 is a hydrogen atom, R^1 is a hydroxymethyl group, an acyloxymethyl group of the formula:

—CH_2—OOC—R^5

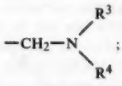
or a cyclic ether group of the formula:



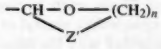
when R^2 is an aminomethyl group of the formula:



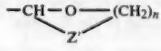
R^1 is an aminomethyl group of the formula:



or when R^2 is a cyclic ether group of the formula:



R^1 is a hydrogen atom or a group of the formula:



or

(2) (a) —X—Y— represents —NH—CH_2—, (b) R^1 is a hydrogen atom, an acyloxymethyl group of the formula: —CH_2—OOC—R^6

(in which R^6 is C_1–C_9 alkyl, cyclohexyl or phenyl, these being optionally substituted with not more than five methyl, methoxy, fluorine, chlorine or trihalomethyl groups or with 3,4-methylenedioxy) or a cyclic ether group of the formula:

(in which p is an integer of 3 or 4) and (c) R^2 is a hydrogen atom or a cyclic ether group of the formula:

(in which p is as defined above), provided that when R^2 is a cyclic ether group of the formula:

R^1 is a hydrogen atom or a cyclic ether group of the formula:

in the free or salt form in a herbicidally effective amount, and at least one inert carrier or diluent.

11. A method for exterminating wild oats, which comprises applying a herbicidally effective amount of at least one of the 3,5-dioxo-1,2,4-triazine derivatives as defined in claim **1** in the free or salt form to the area where it is desired to exterminate or control the wild oats.

4,297,130

METHOD FOR INCREASING THE NUMBER OF PODS IN LEGUMES BY FOLIAR FEEDING

William P. Moore, Jr., P.O. Box 943, Hopewell, Va. 23860

Continuation-in-part of Ser. No. 829,140, Aug. 30, 1977, abandoned. This application Jun. 19, 1979, Ser. No. 50,047

Int. Cl.[3] **A01N** *47/28*; **C05C** *9/00*

U.S. Cl. 71—119 **6 Claims**

1. A method for increasing the conversion of flowers of a leguminous plant to seed pods consisting of applying to the foliage of the plant during the flowering period an aqueous spray of a non-burning plant food comprising the condensation product of urea and formaldehyde composed of from 25–50% water-soluble nitrogenous compounds involving unreacted urea and correspondingly from 75–50% water-insoluble nitrogenous compounds capable of progressively degrading to water-soluble compounds under the influence of the urease and other enzymes and microbes present on the foliage.

4,297,131

PROCESSING OF TITANIFEROUS MATERIALS

John G. Miller, Philadelphia, Pa., and Thomas C. Schwab, Plainfield, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Aug. 30, 1979, Ser. No. 71,018

Int. Cl.[3] **C22B** *1/08, 3/00*

U.S. Cl. 75—1 T **16 Claims**

1. A process for extracting titanium from a titaniferous material selected from the group consisting of minerals containing titanium, titaniferous concentrates or tailings arising from beneficiation of minerals containing titanium and titaniferous waste products or by-products of the processing of minerals containing titanium or mixtures thereof, said titaniferous material containing alumina, silica or combinations thereof, which comprises contacting said titaniferous material at a temperature in the range of about 200° to 500° C. with a chlorinating agent consisting essentially of vaporous thionyl chloride to react at least a part of the titanium contained in said titaniferous material to form titanium tetrachloride without substantially consuming silica and alumina components of said titaniferous material, and separating said titanium tetrachloride from the remainder of said titaniferous material.

11. A process for extracting titanium from a titaniferous material selected from the group consisting of minerals containing titanium, titaniferous concentrates or tailings arising

from beneficiation of minerals containing titanium and titaferous waste products or by-products of the processing of minerals containing titanium or mixtures thereof which comprises contacting said titaniferous material with vaporous thionyl chloride and elevated temperature to react at least a part of the titanium contained in said titaniferous material to form titanium tetrachloride, and separating said titanium tetrachloride from the remainder of said titaniferous material by extraction with a solvent.

12. A process for extracting titanium from a hydrated clay containing a colored titanium oxide as a minor impurity which comprises reacting said clay with vaporous thionyl chloride at elevated temperature to convert at least a part of the titanium contained in said hydrated clay to titanium tetrachloride, the temperature of reaction being insufficient to permanently dehydrate said clay, and separating said titanium tetrachloride from the remainder of said hydrated clay.

4,297,132

ELECTROSLAG REMELTING METHOD AND FLUX COMPOSITION

Balaji V. Patil, and Joseph W. Tommaney, both of Sarver, Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1980, Ser. No. 124,002
Int. Cl.³ C22B *4/00*; B22D *27/02*
U.S. Cl. 75—10 V **24 Claims**

1. A method for electroslag remelting an electrode of an alloy containing oxide forming ingredients, comprising the steps of:

preparing a mixture consisting essentially of at least one compound selected from the group consisting of barium fluoride, calcium fluoride, magnesium fluoride, magnesium oxide, calcium oxide, aluminum oxide, and mixtures thereof,

providing about 1 to 5% boron oxide, by weight, in the mixture,

fusing the mixture to form a flux composition,

bringing the electrode of the alloy to be remelted into contact with the flux composition,

generating sufficient heat in the flux composition to melt the electrode by passing electric current through the flux composition to the electrode, so that the molten alloy passes through the flux composition,

collecting the molten alloy, and

cooling the collected molten alloy to a temperature below the melting point of the alloy.

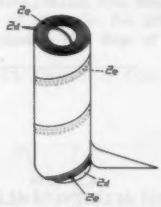
4,297,133

METHOD AND MEANS FOR ADDING TREATING AGENT FOR MOLTEN METAL

Kenji Fujii, Nishinomiya, Japan, assignor to Yoshida Iron Works Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 907,587, May 19, 1978, Pat. No. 4,200,456, which is a continuation-in-part of Ser. No. 799,000, May 20, 1977, abandoned. This application Mar. 4, 1980, Ser. No. 127,203
Claims priority, application Japan, Jul. 15, 1976, 51/84806; Jul. 22, 1976, 51/87983; Jul. 23, 1976, 51/88373; Sep. 16, 1976, 51/111521; Sep. 16, 1976, 51/111522; Sep. 16, 1976, 51/111523
Int. Cl.³ C22B *9/00*
U.S. Cl. 75—53 **13 Claims**

1. A member for adding a treating agent for molten metal, comprising a paper tube formed of kraft paper wound in layers, an air layer being formed between adjacent paper layers, a lid and a weight which are made of a metal for tightly closing



opposite ends of said paper tube, and a treating agent packed in said paper tube.

4,297,134

METHOD OF RECOVERING GOLD

Keita Yamada, Asaka Riken Kohyo Co., Ltd., 47 Aza Maseguchi, Tamura-cho, Kanaya, Koriyama, Fukushima-ken, Japan

Filed Jul. 3, 1980, Ser. No. 165,716
Claims priority, application Japan, Dec. 27, 1979, 54-173793
Int. Cl.³ C22B *11/06*
U.S. Cl. 75—118 R **3 Claims**

1. A process for recovering gold from a raw material containing gold comprising the steps of treating the raw material with either aqua regia or 6.0 to 6.5 normal hydrochloric acid to form chloroauric acid; extracting the chloroauric acid with an organic solvent selected from the group consisting of ethyl ether, methyl isobutyl ketone and a mixture of methyl isobutyl ketone and isoamyl acetate; separating and washing the organic solvent; stripping the gold contained in the organic solvent into an aqueous phase as gold hydroxide by adding a 30 to 50% solution of NaOH or NH_4OH to the organic solvent and agitating the resulting mixture; separating the aqueous layer; reacting the gold hydroxide in the aqueous layer with 3 to 5 normal hydrochloric acid to form chloroauric acid; reducing the chloroauric acid to precipitate the gold; and separating and recovering the gold.

4,297,135

HIGH STRENGTH IRON, NICKEL AND COBALT BASE CRYSTALLINE ALLOYS WITH ULTRAFINE DISPERSION OF BORIDES AND CARBIDES

Bill C. Giessen, Cambridge, Mass.; Donald E. Polk, Washington, D.C., and Ranjan Ray, Waltham, Mass., assignors to Marko Materials, Inc., North Billerica, Mass.

Filed Nov. 19, 1979, Ser. No. 95,383
Int. Cl.³ C22C *19/05, 38/22*
U.S. Cl. 75—123 B **10 Claims**

1. A crystalline metal alloy of the formula $M_aR_bX_c$ where M is at least one element selected from the group consisting of iron, nickel, cobalt and chromium and mixtures thereof, R is at least one element selected from the group consisting of zirconium, tantalum, niobium, molybdenum, tungsten, titanium and vanadium and mixtures thereof and X is at least one element selected from the group consisting of boron, silicon and carbon and mixtures thereof, wherein a, b and c are atomic percentages ranging from 85 to 95, 1 to 12 and 3 to 12, respectively, and boron is present at the level of at least 3 at %, said alloy having been prepared from the melt thereof by a rapid solidification process characterized by cooling rates in the range of about 10^5 to 10^7 ° C./sec, said alloy subsequently subjected to the application of heat thereto and characterized by a fine grained microstructure with primary grains having an average grain size of less than about 10 microns with a substantially uniform dispersion of ultra fine particles of borides in the fine primary metallic grains, said ultra fine particles having a characteristic particle size of less than 0.5 micron and being dis-

persed throughout the inside of the primary grains and along the grain boundaries.

4,297,136

HIGH STRENGTH ALUMINUM ALLOY AND PROCESS

Joseph R. Pickens, Ringwood, N.J.; Robert D. Schelleng, Suffern; Stephen J. Donachie, New Windsor, both of N.Y., and Thomas J. Nichol, Cheshire, Conn., assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,590
Int. Cl.³ B22F *3/14, 3/00*
U.S. Cl. 75—206 **22 Claims**

1. In a process for treating a dispersion-strengthened mechanically alloyed aluminum consisting essentially, by weight, of a small but effective amount for increased strength up to about 7% magnesium, up to about 2½% carbon, up to about 4% oxygen, and the balance essentially aluminum and said dispersoid content being a small but effective amount of dispersoid for improved strength up to about 8¼ volume %, comprising working said aluminum at an elevated temperature to form a hot worked product having a required strength, the improvement comprising:

(a) selecting as the initial charge material a dispersion-strengthened mechanically alloyed aluminum material having in compacted form prior to working, a room temperature strength at least equal to the room temperature strength of the hot worked product, said charge material having the property in a temperature range up to incipient melting of increased workability with increasing working temperature;

(b) determining the working temperature-strength profile of the selected charge material, said profile being charterized by an overall decrease in strength relative to the working temperature; and

(c) working the charge material at a temperature selected with reference to the working temperature-strength profile to optimize the workability of the charge material and the strength of the hot worked product.

11. A process for treating a dispersion-strenghthened mechanically alloyed aluminum consisting essentially, by weight, of a small but effective amount for increased strength up to about 7% magnesium, up to about 2½% carbon, about 0.3% up to about 4% oxygen, and the balance essentially aluminum, the improvement comprising working said aluminum at an elevated temperature to form a worked product of required strength, wherein said aluminum is characterized by increased workability as temperature increases within a temperature range up to incipient melting of said aluminum, and wherein said aluminum is characterized by a working temperature-strength profile for extrusion equivalent to the pattern of FIG. 1 and an extrusion ratio strength pattern equivalent to FIG. 2 Curve A, which comprises:

(a) selecting as the initial charge material a dispersion-strengthened mechanically alloy aluminum having in compacted form prior to working a room temperature tensile strength at least equal to the room temperature strength of the how worked product; and

(b) extruding the charge material at a temperature selected with reference to the working-strength profile equivalent to the pattern shown in FIG. 1 to optimize the workability of the charge material and strength of the worked product.

4,297,137

ANTI-FOULING PAINT

Jean-Pierre Sachetto, Saint-Julien-en-Genevois, France, and Sergio Cuccolo, Geneva, Switzerland, assignors to Centre National pour l'Exploitation des Oceans, Paris, France

Continuation of Ser. No. 885,850, Mar. 13, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,242
Claims priority, application France, Mar. 15, 1977, 77 07626
Int. Cl.³ C09D *5/14*
U.S. Cl. 106—15.05 **5 Claims**

1. In an anti-fouling paint for application to structures immersed in sea water to inhibit attachment of marine organisms to the structures, the paint containing a vehicle comprising a film-forming resin, solvent and a toxic substance; the improvement comprising, as said toxic substance, cuprous oxide or an organic tin compound uniformly dispersed in a discontinuous solid matrix selected from the group consisting of coagulated albumin and regenerated cellulose in the form of a gel, said matrix being insoluble in sea water having no marine organisms or bacterial film, and which becomes soluble in sea water only after being contacted by enzymes produced by the marine organisms and/or the bacterial film,

whereby said matrix dissolves and releases said toxic substance only in the presence of the marine organisms and/or the bacterial film.

4,297,138

COPOLYCONDENSATION PRODUCTS OF β-HALOALKYL PHOSPHATES AND DIALKYL PHOSPHONATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 858,316, Dec. 7, 1977, Pat. No. 4,152,371, which is a division of Ser. No. 811,972, Aug. 5, 1977, Pat. No. 4,086,303, and a continuation-in-part of Ser. No. 783,995, Apr. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 558,862, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 410,583, Nov. 12, 1973, abandoned. This application Jan. 2, 1979, Ser. No. 231
Int. Cl.³ C08K *5/53;* **C09D** *5/18;* **D21H** *5/00*
U.S. Cl. 106—18.18 **10 Claims**

1. A flame retardant composition comprising in admixture a polymer and, as a flame retardant, a copolycondensation product of a beta-haloalkyl phosphate having from 2 to 4 carbon atoms in the alkyl moiety and a dialkyl phosphonate of the formula

where R' is alkyl of from 1 to 20 carbon atoms, alkenyl of from 3 to 20 carbon atoms, or phenyl optionally substituted with alkyl of from 1 to 4 carbon atoms and/or halogen, and R is alkyl of from 1 to 4 carbon atoms, said product being obtained by heating the phosphate with the dialkyl phosphonate until at least about one molar equivalent of alkyl halide is evolved.

4,297,139

INORGANIC GELS AND CERAMIC PAPERS, FILMS, FIBERS, BOARDS, AND COATINGS MADE THEREFROM

George H. Beall, Big Flats; David G. Grossman, Corning; Syed N. Hoda, Horseheads, and Karen R. Kubinski, Elmira Heights, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 23,907, Mar. 26, 1979, Pat. No. 4,239,519. This application Jun. 25, 1980, Ser. No. 162,764
Int. Cl.³ C03C *3/22*
U.S. Cl. 501—2 **9 Claims**

1. Inorganic gels containing a polar liquid and relatively

uniformly-sized crystals consisting essentially of a lithium and/or sodium water-swelling mica selected from the group of fluorhectorite, hydroxyl hectorite, boron fluorphlogopite, hydroxyl boron fluorphlogopite, and solid solutions among those and between those and other structurally-compatible species selected from the group of talc, fluortalc, polylithionite, fluorpolylithionite, phlogopite, and fluorphlogopite, at least a substantial portion of said crystals exhibiting a morphology of a continuum of flakes, rectangular-like strips, and interwoven ribbons in parallel or sub-parallel zones or sheaths with said strips and ribbons being about 0.5–10 microns long, about 500 A–5000 A wide, and less than about 100 A thick, and said flakes being irregularly shaped with diameters between about 0.5–10 microns and cross sections of less than about 100 A.

4,297,140
CERAMIC FOAM CEMENT

Robert J. Paisley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,647
Int. Cl.³ C04B *33/00*
U.S. Cl. 428—310 **15 Claims**

1. A foamable particulate ceramic cement capable of forming a sintered cordierite foamed ceramic mass and consisting essentially, by weight, of:

1–40% cordierite grog,

99–60% ceramic base material and an effective amount of a foaming agent to effect foaming of the cement upon firing to produce the foamed ceramic mass,

the base material being raw ceramic material that has an analytical molar composition consisting essentially of about:

1.7–2.4 MO·1.2–2.4 Al_2O_3 ·4.5–5.4 SiO_2 wherein MO comprises, as mole % of MO, about 0–55% MgO and at least 45% MnO, and

the grog being ceramic material that has been previously fired and comminuted, and that has an analytical molar composition consisting essentially of about:

1.7–2.4 RO·1.9–2.4 Al_2O_3 ·4.5–5.2 SiO_2 wherein RO comprises, as mole % of RO, MnO in an amount of 0% up to a mole % that is about 20 mole % lower than the mole % of MO that is MnO and the balance is substantially MgO.

4,297,141
OPTICAL GLASS FOR OPTICAL PATHS

Shinobu Tokunaga, Yono, and Yuichi Shiina, Warabi, both of Japan, assignors to Sumita Optical Glass Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 69,107, Aug. 21, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,481
Claims priority, application Japan, Sep. 5, 1978, 53-108882; Apr. 9, 1979, 54-42921
Int. Cl.³ C03C *3/04, 3/08*
U.S. Cl. 501—67 **1 Claim**

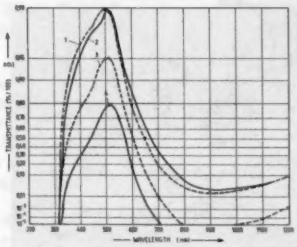
1. An optical glass for an optical path having a refractive index of at least 1.55, an Abbe number of at least 48 and a specific gravity of at most 2.90, which consists essentially of

SiO_2	55 to 65% by weight
B_2O_3	0 to 10
$TiO_2 + ZrO_2$	1 to 5
TiO_2	0 to 5
ZrO_2	0 to 5
$CaO + ZnO$	20 to 33
CaO	5 to 20
ZnO	3 to 20
Al_2O_3	0 to 4
at least one of	
R_2O (Li_2O, Na_2O, K_2O)	5 to 9
As_2O_3	0 to 1

4,297,142
OPTICAL COLORED AND FILTER GLASS

Willy Ritze, Mainz, Fed. Rep. of Germany, assignor to Jenaer Glaswerk, Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,700
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926721
Int. Cl.³ C03C *3/16, 3/24*
U.S. Cl. 501—77 **7 Claims**



1. A low alkali, high phosphate and high Al_2O_3 content glass suitable for optical colored and filter glasses characterized by having a glass transformation temperature Tg>450° C. and consisting essentially of the following composition, in percent by weight:

P_2O_5	71.0–76.0
SiO_2	0.25–2.5
B_2O_3	2.4–3.75
Al_2O_3	8.6–11.6
R_2O (alkali oxide)	1.25–6.5
CaO	0.5–1.65
MgO	2.0–3.5
Refining Agent	0.2–0.6
CeO_2	0.1–0.4
F	0.2–0.4 and
CuO	1.0–10.0.

7. The composition according to any one of claims **1** thru **6** in the form of an optical filter glass.

4,297,143
TEMPERATURE STABILIZED SILICON DIOXIDE-MIXED OXIDE, THE PROCESS FOR ITS PRODUCTION AND USE

Peter Kleinschmit, Hanau, and Rudolf Schwarz, Alzenau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 174,341
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1979, 2931810
Int. Cl.³ C04B *35/14;* C01B *33/12*
U.S. Cl. 501—103 **26 Claims**

1. Pyrogenically produced, temperature stabilized silicon dioxide-mixed oxide having a BET surface of 50 to 400 m^2/g, the other component of the mixed oxide being

0.01 to 10 weight % zirconium dioxide or

0.01 to 10 weight % ferric oxide or

0.1 to 9.9 weight % titanium dioxide.

19. A process of preparing a stabilized silicon dioxide-mixed oxide having a BET surface of 50 to 400 m^2/g, the other component of the mixed oxide being

0.01 to 10 weight % zirconium dioxide or

0.01 to 10 weight % ferric oxide or

0.1 to 9.9 weight % titanium dioxide and

wherein the silicon dioxide is stabilized up to a temperature of 1150° C. against reduction in surface area to below 50 m^2/g, comprising vaporizing silicon tetrachloride, diluting it with

preheated air in the ratio of 0.5 to 1.2 kg of silicon-tetrachloride to 0.8 to 1.2 Nm^3 of air, supplying it to a burner having a mixing chamber, mixing the diluted silicon tetrachloride in the mixing chamber with hydrogen and vapor form ferric chloride, zirconium tetrachloride or titanium tetrachloride in the ratio as to give an silicon dioxide-other component mixed oxide containing

0.01 to 10% zirconium dioxide or

0.1 to 10% ferric oxide or

0.1 to 9.9% titanium dioxide,

and wherein the ratio of hydrogen to the total of silicon tetrachloride and the chloride of the other element is 0.8 to 1.5 Nm^3 of hydrogen to 2.8 to 3.3 kg of total chlorides, buring the 4-component mixture in a reaction chamber, separating the solid silicon dioxide-mixed from the gaseous reaction products and freeing the solid silicon dioxide-mixed oxide from adhering hydrogen chloride by heating in moist air.

4,297,144

HIGH SPEED CORRUGATING ADHESIVES

Gary H. Klein, LaGrange; Howard L. Arons, LaGange Park; Joseph F. Stejskal, Brookfield; Donald G. Stevens, Clarendon Hills, and Henry F. Zobel, Darien, all of Ill., assignors to CPC International Inc., Inglewood Cliffs, N.J.

Continuation of Ser. No. 795,253, May 9, 1977, abandoned, which is a division of Ser. No. 598,095, Jul. 22, 1975, abandoned. This application Aug. 13, 1979, Ser. No. 66,269

Int. Cl.[3] **C08L** *1/26, 3/06;* **C09J** *3/06*

U.S. Cl. 106—197 C **15 Claims**

1. In a process for the preparation of a corrugating adhesive composition of the no-carrier type, comprising the steps of preparing a heated reaction mixture of ungelatinized starch material, water and alkali, allowing the reaction to proceed until a Stein-Hall viscosity of about 20 to about 90 seconds is reached, and adding a reaction stopper to the mixture, the improvement which consists of replacing at least a portion of the starch material with a saponifiable starch ester derived from a non-waxy grain source characterized as having at least about 30% greater area under an Instron force-time heating curve, and at least about 30% greater area under an Instron force-time cooling curve compared with unmodified corn starch under the same test conditions and having a saponifiable D.S. of at least about 0.015.

4. An adhesive composition for use in a high speed corrugating process which comprises an aqueous dispersion of the reaction product of:

(1) a starch material formed by saponfication of a starch ester derived from a non-waxy grain source having a saponifiable degree of substitution of at least about 0.015 and characterized as having at least about 30% greater area under an Instron force-time heating curve and at least about 30% greater area under an Instron force-time cooling curve than unmodified corn starch under the same test conditions; and

(2) an amount of alkali sufficient to substantially completely saponify said ester and to render said composition effective in said process.

4,297,145

SILANE/FILLER PREPARATIONS, PROCESS FOR THEIR PRODUCTION AND THEIR USE

Siegfried Wolff, Bornheim-Merten; Lothar Rothbühr, Hürth-Hermülheim, and Heinz Grewatta, Cologne, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 178,159

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933346

Int. Cl.[3] **C09C** *1/28*

U.S. Cl. 106—308 Q **23 Claims**

1. A silane/filler preparation, consisting essentially of from 5 to 70% by weight of at least one silane corresponding to the following formula

$$X_p—C_mH_{2m+1-p}SiR_n^1(OR)_{3-n} \qquad I$$

in which

X=a halogen atom

p=1 or 2,

m=1 to 5,

R^1=a C_1- to C_5-alkyl group, a C_5- to C_8-cycloalkyl group or the phenyl group,

R=a C_1- to C_5-alkyl group, a C_5- to C_8-cycloalkyl group, the phenyl group, the benzyl group or a C_1- to C_5-alkoxy-C_1- to C_5-alkyl group, and

n=0, 1 or 2,

and—respectively balanced to 100%—from 95 to 30% by weight of at least one inorganic filler based on the two components.

4,297,146

METHOD FOR THE PRODUCTION OF POWDERED DEXTROSE

Yoshinari Mise, Inagi, and Eijiro Tomimura, Tokyo, both of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 4, 1976, Ser. No. 729,325

Int. Cl.[3] **C13F** *1/02, 3/00*

U.S. Cl. 127—60 **8 Claims**

1. A method for the production of powdered dextrose containing a substantial portion of anhydrous β-dextrose from an aqueous solution containing dextrose comprising the steps of:

(a) concentrating said solution containing dextrose to a concentration of within the range of about 90% and about 98%, by weight dry substance;

(b) introducing into said concentrated solution at least about 0.2%, by weight of sugar, of seed crystals containing β-dextrose at a temperature above about 80° C.; and

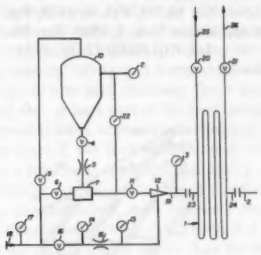
(c) vacuum dehydrating said concentrated solution with stirring while maintaining said temperature above about 80° C. to remove free water.

4,297,147

METHOD FOR DECOKING FIRED HEATER TUBES

David J. Nunciato, Missouri City, Tex.; Norman H. White, Huntington Beach, Calif., and William A. Woodburn, Kingwood, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 906,748, May 17, 1978, Pat. No. 4,203,778. This application Apr. 24, 1980, Ser. No. 143,333
The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.
Int. Cl.³ B08B 9/02
U.S. Cl. 134—7 12 Claims



1. A method for decoking fired heater tubes used in hydrocarbon or chemical processing, while maintaining the integrity of the straight sections of tube walls and the return bends of said fired heater tubes, or of said tubes having equivalent continuous helical tube configurations, comprising:

(a) establishing a gas inlet to and a gas outlet from said fired heater tubes having straight sections of tube walls and return bends, or equivalent continuous helical tube configurations;

(b) injecting a purge gas stream into the inlet while the outlet is open to the atmosphere to purge the tubes of loose debris until the effluent is essentially clear;

(c) entraining impact resistant, non-angular, non-abrasive particles into a propelling gas stream at a concentration of from about 0.1 to about 10.0 pounds of particles per pound of propellant;

(d) introducing the impact resistant, non-angular, non-abrasive particle entrained gas stream into the inlet of said fired heater tubes having straight sections and return bends, or equivalent continuous helical tube configurations, while the outlet remains open to the atmosphere at a gas flow rate corresponding to an outlet gas velocity of from about 5,000 feet per minute up to the sonic velocity of said propelling gas;

(e) maintaining the flow of the gas stream in step (d) for a sufficient time to effect decoking of said tubes;

(f) discontinuing the entraining of impact resistant, non-angular, non-abrasive particles into said propelling gas stream;

(g) continuing the flow of propelling gas into said tubes to clear such tubes of loose coke debris; and

(h) repeating steps (c), (d), (e) and (f) until the tubes are clean, as evidenced by an essentially coke-free clear effluent from the outlet, whereby grinding—type abrasion of the straight sections of tube walls and gouging—type abrasion of the return bends, or of equivalent continuous helical tube configurations, are eliminated.

4,297,148

MASONRY CLEANING PROCESS AND COMPOSITION

Panagiotis Zervopoulos, 514 Pape Ave., Toronto, Canada (M4K 3R2)

Filed Apr. 14, 1980, Ser. No. 139,942
Claims priority, application Canada, Apr. 17, 1979, 325783
Int. Cl.³ B08B 3/08
U.S. Cl. 134—3 5 Claims

4. A method of cleaning masonry surfaces comprising: applying to said surface, for a predetermined time sufficient to loosen deposits therefrom, a composition comprising, by weight, about 8 to 30% sulphuric acid; about 23 to 30% hydrogen fluoride; about 0.1 to 0.2% chromic acid; about 0.9 to 1.8% water miscible wetting agent, and the balance water, and then washing said surface with water.

4,297,149

METHOD OF TREATING SIPOS PASSIVATED HIGH VOLTAGE SEMICONDUCTOR DEVICE

Patrick R. Koons, Round Rock, Tex., and John M. S. Neilson, Mountaintop, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 5, 1980, Ser. No. 146,380
Int. Cl.³ H01L 21/265, 21/205; G06F 15/46
U.S. Cl. 148—1.5 6 Claims

1. In a process of fabricating a semiconductor device having oxygenated polycrystalline silicon passivation layers the improvement comprising:

annealing the devices at at least 525° C. prior to metallization;

cooling the devices rapidly through the 500° C. to 450° C. temperature range at the end of said annealing;

preventing the devices from subsequently being heated to any temperature higher than 425° C.; and

preventing the devices from being exposed to any temperature above 400° C. for longer than a total of ten minutes subsequent to the annealing whereby the devices will have near the maximum breakdown voltage of which their structure is capable.

4,297,150

PROTECTIVE METAL OXIDE FILMS ON METAL OR ALLOY SUBSTRATE SURFACES SUSCEPTIBLE TO COKING, CORROSION OR CATALYTIC ACTIVITY

Alan I. Foster, Ashford; Malcolm L. Sims, Hersham, and Dennis Young, Staines, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Jun. 27, 1980, Ser. No. 163,866
Claims priority, application United Kingdom, Jul. 7, 1979, 23787/79
Int. Cl.³ C23C 7/02
U.S. Cl. 148—6.3 14 Claims

1. A process for forming protective films on a structural metal or alloy substrate surface which comprises first pre-oxidising the surface at an elevated temperature in an oxidixing atmosphere and then depositing on the preoxidised substrate surface a film of a high temperature stable, non-volatile oxide of a metal selected from calcium, magnesium, aluminium, gallium, titanium, zirconium, hafnium, tantalum, niobium and chromium by thermal decomposition from the vapour phase of a volatile compound of the metal having at least one metal-oxygen bond in admixture with an inert or oxygenated carrier gas in contact with the pre-oxidised surface.

4,297,151

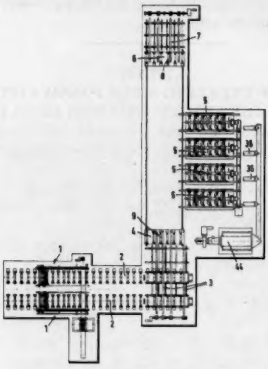
METHOD FOR DIVIDING A STRAND INTO SLABS

Erich Höffken, Dinslaken; Werner Kleine-Kleffmann; Rolf Bertram, both of Duisburg; Karl-Heinz Abele, Dinslaken, and Günter Michalski, Kamp-Lintfort, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vormals August Thyssen-Hutte, Duisburg, Fed. Rep. of Germany

Division of Ser. No. 884,788, Mar. 9, 1978, Pat. No. 4,208,039. This application Dec. 18, 1979, Ser. No. 104,991
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710564; Mar. 11, 1977, 2710574
Int. Cl.³ B23K 7/00
U.S. Cl. 148—9 R 3 Claims

1. A method of cutting a cast strand into longitudinal sections which comprises initially severing said strand transversely to form a slab, transporting said slab to a first longitudi-

nal cutting means, longitudinally cutting said slab in said first longitudinal cutting means, cutting said strand transversely a second time to form a second slab, transporting said second



slab to a second longitudinal cutting means, longitudinally cutting said second slab in said second longitudinal cutting means and recovering longitudinally cut slabs from said first and second longitudinal cutting means.

4,297,152

ENERGETIC MONOPROPELLANT

Milton B. Frankel, Tarzana; Harry A. Arbit, Encino; Glen D. Artz, Canoga Park, and John C. Gray, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1980, Ser. No. 110,888

Int. Cl.[3] **C06B** *25/00*

U.S. Cl. 149—88 **4 Claims**

1. A liquid monopropellant composition comprising a mixture of bis (2,2-dinitropropyl) acetal, bis (2,2-dinitropropyl) formal and bis (2,2,2-fluorodinitroethyl) formal.

4,297,153

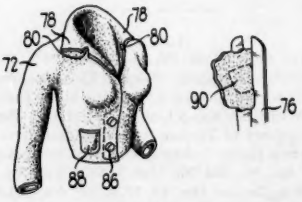
METHOD AND APPARATUS FOR MAKING DOLL CLOTHING AND DOLL HOUSE ACCESSORIES

Erick E. Erickson; Allison W. Katzman, both of Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 10,806, Feb. 9, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 160,917

Int. Cl.[3] **B44C** *3/02;* **B29C** *13/04;* **A41D** *1/00*

U.S. Cl. 156—63 **15 Claims**



1. A method for making doll house accessories which comprises the steps of:

providing a mold having physical dimensions similar to a portion of the accessory to be formed;

applying a water soluble resinous film forming liquid to the surfaces of said mold;

forming a plastic film on said surfaces by allowing said liquid to dry;

removing the finished accessory from the mold; and

attaching decorative elements to said plastic film by moistening the contact surface of said film to which said element is to be attached.

4,297,154

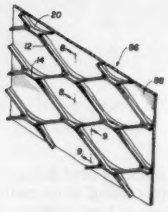
METHOD OF MANUFACTURING EXPANDED REINFORCING SHEET MATERIAL

Robert N. Keller, Utica, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 10,791, Feb. 9, 1979, Pat. No. 4,259,385. This application Nov. 3, 1980, Ser. No. 203,382

Int. Cl.[3] **B32B** *31/16, 3/24*

U.S. Cl. 156—79 **41 Claims**



1. A method of reinforcing an article, the method comprising,

bonding a layer of a foamable adhesive material to at least one surface of a flat sheet of structural material capable of being formed into an expanded sheet,

forming a series of laterally spaced lines of slits through the sheet of structural material and the adhesive material bonded thereto with the slits in each line being spaced from one another and being offset longitudinally with respect to the slits in adjacent lines of slits,

simultaneously expanding the sheet of structural material and the foamable adhesive bonded thereto by spreading said slits to form a uniform pattern of generally diamond-shaped openings in the sheet of structural material and foamable adhesive,

positioning the expanded structural sheet having the foamable adhesive thereon in contact with the article to be reinforced, and

activating the foamable adhesive material to enlarge its volume and form a bond between the expanded structural sheet and the article.

4,297,155

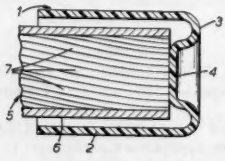
HEAT-SHRINKABLE HOLLOW ARTICLE

James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 3, 1978, Ser. No. 875,110

Int. Cl.[3] **B29C** *27/00;* **H02G** *15/02;* **F10L** *57/00;* **B65D** *59/06*

U.S. Cl. 156—86 **3 Claims**



1. A process for covering the end of a cable comprising

positioning over the end of the cable a heat-recoverable cap having a closed end and an open end and a dimensionally heat-unstable boss projecting into the internal cavity of the cap from said closed end of the cap so that the end of the cable abuts the boss, and heating the cap including the boss to cause the cap to shrink about the cable end and to cause the boss to retract to a dimensionally heat-stable form to leave a gap between the end of the cable and the closed end of the cap, wherein the boss in its dimensionally heat-stable form does not project into said gap.

2. A heat-recoverable hollow cap having a wall defining a closed end and an open end, at least a portion of the wall being heat-unstable, the open end of the cap affording access to a relatively large internal cavity of relatively large circumference, the heat-unstable wall of the cap defining the shape of the relatively large internal cavity and being shaped to provide a boss which projects into said relatively large internal cavity from said closed end, at least part of the boss being in a dimensionally heat-unstable form, wherein upon heating of the cap to cause recovery thereof, the heat-unstable wall of the cap recovers to form a relatively small internal cavity of relatively small circumference compared to the circumference of the relatively large internal cavity, such recovery resulting in the boss being in a dimensionally heat-stable form that projects less into the relatively small internal cavity than the boss projects into the relatively large internal cavity.

4,297,156
PROCESS FOR MANUFACTURE OF WALL COVERINGS AND WALL COVERINGS THUS OBTAINED

Joël Dalle, Bondues, France, assignor to Dalle & Cie, S.A., Wervicq, France

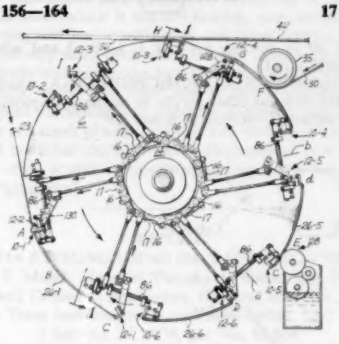
Filed Feb. 1, 1979, Ser. No. 8,581
Claims priority, application France, Feb. 24, 1978, 78 06257
Int. Cl.³ B32B 7/08
U.S. Cl. 156—93 **1 Claim**

1. Process of manufacture of a complex providing a wall covering and composed of an element of textile nature associated with a support of dimensionally indeformable material on which support the textile element is fixed by fusion of a film of thermoplastic material interposed between the textile element and the support, the steps of forming the textile element on a crocheting machine for the deposit of at least one warp band of threads or meshes in zigzags the peaks of which are substantially perpendicular to the direction of advance of the work, prefixing the warp in position by chain stitching parallel to the direction of advance of the work, forming the textile element in at least one layer exactly to the width of the final covering, stabilizing the textile element in width and straightness by supplying the machine with a support and fusible film of greater width than that of the said element, prefixing the warp to the support and film by the chain stitching which also positions the sections of the warp, locating certain of said chain stitching on the warp along each edge of the warp to prevent the marginal portions of the warp from moving before fixing by fusion of the film and in such a way that each edge stitching of the warp provides a line of precutting of the support and of its film to facilitate the ultimate tearing away of the excessive width of the support, and then heating the warp fiber and support to fuse the film and positively fix the textile element on the support.

4,297,157
METHOD FOR APPLICATION OF ELASTIC TO ARTICLES

Raymond A. Van Vliet, Auburn, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 23, 1980, Ser. No. 161,722
Int. Cl.³ B32B 31/08
U.S. Cl. 156—164 **17 Claims**



1. A method of applying units of an elastic material to a predetermined area of an article comprising:

a. providing a continuous source of the elastic material;
b. tensioning the elastic material;
c. grasping the leading end of the elastic material in a first clamping means;
d. grasping the tensioned elastic material in a second clamping means at a predetermined distance from the first clamping means, said distance being greater than the length of the elastic unit applied to the article;
e. severing the portion of elastic held between the clamping means from the main body of elastic material at a location adjacent to the second clamping means;
f. moving the clamping means closer together to a separation which defines the length of the elastic unit applied to the article;
g. bonding the elastic unit to the desired area of at least one component of the article; and
h. releasing the elastic from the clamps after the bond has been established.

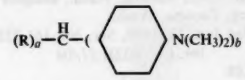
4,297,158
NON-TOXIC ACTIVATORS FOR ADHESIVE COMPOSITIONS

Leon E. Wolinski, Cheektowaga, and Peter D. Berezuk, Kenmore, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Division of Ser. No. 858,702, Dec. 8, 1977, Pat. No. 4,155,950, and a continuation-in-part of Ser. No. 763,145, Jan. 27, 1977, Pat. No. 4,126,504, and Ser. No. 705,333, Jul. 14, 1976, Pat. No. 4,080,238. This application Apr. 2, 1979, Ser. No. 26,015
Int. Cl.³ C09J 5/04
U.S. Cl. 156—305 **7 Claims**

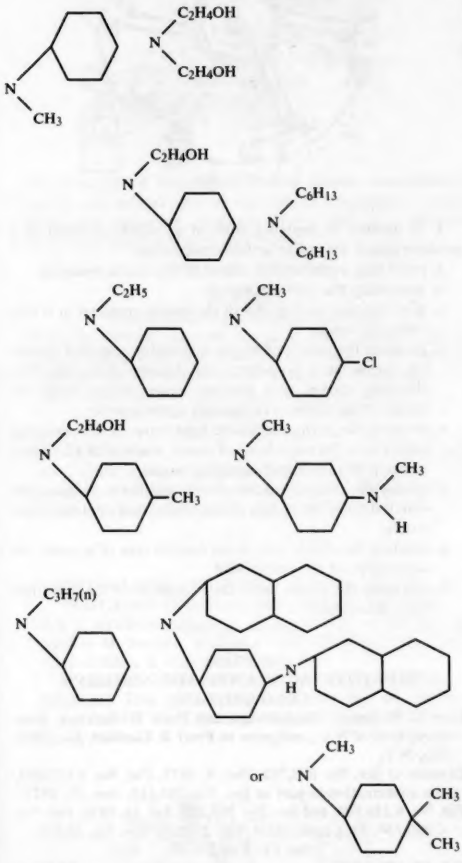
1. In the method of adhesively joining a pair of mating surfaces comprising applying to at least one of said mating surfaces an activatable, curable adhesive comprising a non-reactive thermoplastic polyurethan resin or a non-reactive elastomer dissolved in a non-acid methacrylic or acrylic monomer and a methacrylic or acrylic acid monomer, said monomers being essentially devoid of peroxy catalyst activation capability, said solution containing an effective amount of peroxy catalyst, the said adhesive being activatable by contact with a peroxy catalyst activator; the improvement comprising, in any order, the steps of joining said pair of mating surfaces together in a contact relationship and activating the adhesive

by contacting it with an activator compound selected from the group consisting of:



(a) R=H or phenyl, a=0 or 1, a+b=3 and when R is phenyl, a is 1,

(b) $CH_2{=}CH(CH_3)COOCH_2CH(OH)CH_2A$, which is different from the other acrylic or methacrylic monomers in the adhesive, wherein A is one of:



(c) homopolymers of the compounds of (b),

(d) a copolymer of at least 25% by weight of a compound of (b) with a member selected from the group consisting of methyl methacrylate, methyl acrylate, 2-ethyl hexyl acrylate, or butyl acrylate, the reaction products of epoxy polymers with secondary amines selected from the group consisting of N-methyl aniline, N-methyl-p-toluidine, N-β-hydroxy ethyl aniline, N-ethyl aniline, N-n-propyl aniline, N-β-hydroxy ethyl-p-toluidine, diethanol amine, dihexyl amine, p-chloro-N-methylaniline, N,N'-dimethyl-p-phenylene diamine, N,N'-di-2-naphthyl-p-phenylene diamine and N-methyl-3,5-xylidene wherein from 0.25 to one amino equivalent weight is reacted with one oxirane equivalent weight, and then maintaining the contact relationship of the surfaces until the adhesive cures to a set.

4,297,159

METHOD TO DIRECTLY BOND RUBBER TO METAL

Bohuslav Dobias, Regensburg, Fed. Rep. of Germany, and Klaus Heckmann, Zum Aichahof 20, D-8400, Regensburg, Fed. Rep. of Germany, assignors to Klaus Heckmann, Regensburg, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,732

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832235

Int. Cl.³ C09J *5/00*

U.S. Cl. 156—307.7 **11 Claims**

1. A process for directly bonding a rubber composition to metal surfaces comprises:

(a) contacting the surface of a metal selected from the group consisting of iron, copper, brass, zinc, aluminum, bronze and brass-plated steel with a composition comprising a vulcanizable rubber and conventional rubber-sulfur vulcanization compounding ingredients, a bonding aid selected from the group consisting of elemental tellurium and organotellurium compounds being used to improve the bond between said metal surface and said composition by incorporation thereof in said composition or by application thereof directly to said metal surface; and

(b) subjecting the product of step (a) to pressure and temperature conditions sufficient to effect the vulcanization of said composition.

4,297,160

LOCKING AND SEALING COMPOSITIONS AND METHODS FOR THEIR APPLICATION

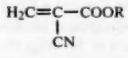
Senji Kusayama, Toyonaka; Eijiro Nishi, Otsu, both of Japan, and Hugh J. Stock, Saratoga, Calif., assignors to Pacer Technology and Resources, Inc., Campbell, Calif. and Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Jul. 16, 1979, Ser. No. 57,666

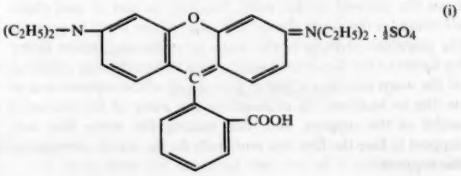
Int. Cl.³ C09J *5/00*

U.S. Cl. 156—331.1 **11 Claims**

1. A method of bonding threaded parts and analogous structures while sealing them from extraneous injurious substances which comprises adding to a rapidly polymerizable monomer of an alpha cyanoacrylate ester of general formula,



wherein R is a radical containing a total of 1 to 16 carbon atoms, said radical being selected from the group which consists of alkyl, alkenyl (with 2 to 6 carbon atoms), alkoxyalkyl (with 2 to 6 carbon atoms), cyclohexyl, and phenyl, a coloring agent in proportions of 100 to 5000 parts per million parts by weight of the monomer, selected from the group which consists of modified dyestuffs, red, blue or yellow in color, and mixtures thereof, having respectively the formulas,



(i)

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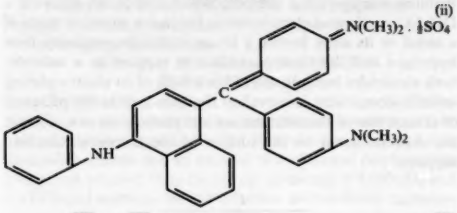
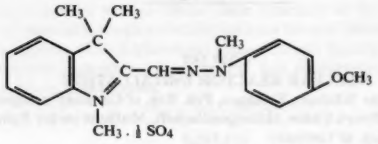
(ii)



(iii)



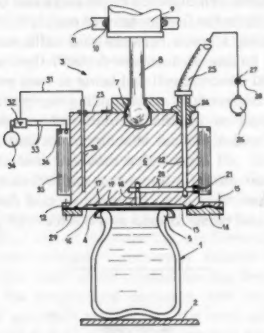
applying said monomer as a coating film to the surfaces to be joined and protected, contacting the coated surfaces, and polymerizing said monomer in situ to form a visibly colored bonding film on said surface while limiting the ultimate strength of said film by reason of strength modifying properties of said coloring agent, without retarding the rapid curing properties of the monomer.

4,297,161

METHOD AND APPARATUS FOR HEAT-SEALING LIDS ON GLASS CONTAINERS

Andre J. Graffin, La Ferte Bernard, France, assignor to Serac, France

Continuation of Ser. No. 952,227, Oct. 17, 1978, abandoned. This application Jul. 22, 1980, Ser. No. 171,182
Claims priority, application France, Nov. 3, 1977, 77 33046
Int. Cl.³ B30B *5/02, 15/34;* B65B *7/28*
U.S. Cl. 156—583.3 **4 Claims**



1. A device for sealing a heat-sealable composite lid onto a glass container, said lid comprising a foil of a ductile light alloy coated on one side with a layer of heat sealable thermoplastic material, said device comprising:

means for supporting said container;

a hingedly and movably supported applying head, having a supporting frame, a flexible membrane supported by its outer periphery on said supporting frame, so as to extend in rest position substantially in a plane, said membrane having an outer contacting surface and an inner face, a heat transfer mass arranged on the side of said inner face of said membrane and means for controllably heating said heat transfer mass;

means for selectively and controllably displacing toward and away from each other said applying head and said container supporting means; and,

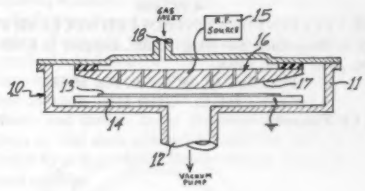
said applying head further comprising a metallic body on one end of which is mounted said membrane supporting frame, said body being provided with at least one inner chamber closed by at least a portion of said inner face of said membrane, said membrane consisting of a simple metal sheet which is not self-heating, said metallic body forming said heat transfer mass, said inner chamber having a relatively small thickness and being limited, on the side opposite said membrane, by a substantially flat face of said metallic body, said inner face of said membrane being adapted for coming into contact engagement with said flat face as a result of a distortion of said membrane caused by said container during relative displacement one toward the other of said container supporting means and of said applying head.

4,297,162

PLASMA ETCHING USING IMPROVED ELECTRODE

Randall S. Mundt, Houston; Timothy A. Wooldridge, Missouri City, and Thomas O. Blasingame, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 17, 1979, Ser. No. 85,564
Int. Cl.³ H01L *21/306;* C23F *1/00*
U.S. Cl. 156—643 **14 Claims**



12. A method of etching a coating on a generally circular silicon slice comprising

(a) positioning the slice symmetrically in a chamber on a conductive holder,

(b) positioning an electrode facing the slice in the chamber, the electrode being of generally symmetrical shape with respect to the slice and having a central part closer to the slice than peripheral parts,

(c) admitting reaction gas to the chamber while vacuum-pumping the chamber,

(d) applying radio frequency voltage between the holder and the electrode.

13. A method according to claim **12** wherein said central part is shaped in a convex manner generally symmetrical with respect to the slice.

4,297,163

DRYING OF POTASSIUM SILICATE

Jeffrey R. Thomas, Aston, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Filed Jan. 7, 1980, Ser. No. 110,276
Int. Cl.³ B01D *1/18*
U.S. Cl. 159—48 R **2 Claims**

1. In the process of spray drying potassium silicate solution to obtain powders, comprising the steps of atomizing said potassium silicate solution in a spray drying tower and subjecting the resulting droplets to elevated temperatures in said spray tower thereby removing water from the droplets and drying them: the improvement consisting of dispersing a hydrophilic silane in said potassium silicate before atomizing the solution, wherein 0.05 to 2.5 parts by weight of the hydrophilic silane are added for each 100 parts by weight of potassium silicate solids contained in said potassium silicate solution.

4,297,164

PROCESS FOR DISPLACEMENT WASHING OF POROUS MEDIA

Peter F. Lee, Auburn, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 10, 1980, Ser. No. 129,009
Int. Cl.[3] D21C 9/06
U.S. Cl. 162—60 23 Claims

1. In a process for separating a liquid from an insoluble material which includes the steps of thickening said insoluble material by draining excess liquid therefrom while retaining the material in a porous formation on a porous support means and displacing a substantial portion of the liquid remaining in the insoluble porous material after thickening from said material by injecting a wash liquid into said material, without substantially disturbing said porous formation of the retained material, the improvement, comprising:

reducing the mobility of said wash liquid in the porous formation of the insoluble material with respect to the mobility of said liquid originally retained in the porous insoluble material,

wherein the mobility of a liquid with respect to a porous formation is proportional to the permeability of the porous formation to a liquid and inversely proportional to the viscosity of said liquid,

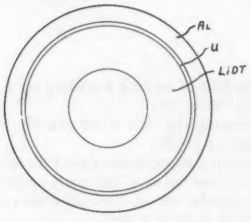
such that the ratio of wash liquid mobility to the mobility of the liquid to be displaced is about 0.05–2.0.

4,297,165

FUEL PELLETS FOR CONTROLLED NUCLEAR FUSION

Keith A. Breuckner, San Diego, Calif., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Jul. 13, 1970, Ser. No. 65,756
Int. Cl.[3] G21B 1/00
U.S. Cl. 376—103 7 Claims



1. A method of increasing the efficiency of a fusion burn of a small quantity of fusion fuel which comprises:

(a) surrounding the fusion fuel with a contiguous envelope of uranium,

(b) encasing the fuel and the uranium envelope in a contiguous layer of a relatively light material selected from aluminum and beryllium,

(c) directing a laser beam toward said fuel to cause a transfer of fast neutrons from said fuel to said uranium and a fission reaction in said uranium to heat said fuel and maintain a high pressure on said fuel to retard the disassembly of the fusion fuel.

4,297,166

THALLIUM-CARRYING TARGET MATERIAL AND ITS PRODUCTION

Makoto Kato, Kobe; Nobuo Ueda, Takarazuka, and Hiroaki Matsushima, Nishinomiya, all of Japan, assignors to Nihon Medi-Physics, Co., Ltd., Hyogo, Japan

Filed Feb. 16, 1979, Ser. No. 12,809
Claims priority, application Japan, Feb. 20, 1978, 53-18678
Int. Cl.[3] C25D 3/02, 3/54; G21G 1/10
U.S. Cl. 376—194 10 Claims

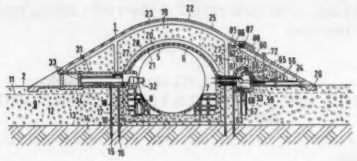
1. A method for production of a thallium-carrying target material comprising a thermo-conductive support and metallic thallium electro-plated thereon, which comprises applying a DC-AC overlapped electric current between an anode made of a metal or its alloy having a lower ionization tendency than hydrogen and the electro-conductive support as a cathode, both electrodes being immersed in a bath of an electro-plating solution comprising monovalent thallium ions in the presence of at least one of aromatic amines and phenols, so as to deposit the thallium metal on the surface of the thermo-conductive support.

4,297,167

NUCLEAR REACTOR INSTALLATION

Hans-Peter Schabert, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,117
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634295
Int. Cl.[3] G21C 9/00
U.S. Cl. 376—273 25 Claims



16. Nuclear reactor installation having a concrete cell disposed beneath the earth and having a hill of fill-earth directly covering the top of the concrete cell for enclosing activity-carrying components comprising at least one additional self-enclosed concrete cell disposed in the earth and being isolated and separated from the first-mentioned concrete cell by a given distance forming a space between said cells, said additional concrete cell having at most one-fortieth the volume of the first-mentioned concrete cell and being at least predominantly of shell-like construction, and including equipment of use for the nuclear reactor installation received in said additional concrete cell and a conical attachment located in said additional concrete cell for a valve mounted thereat, said valve being in at least one of a live steam and a feedwater line for closing said line, said line extending to said first-mentioned concrete cell and being formed as a double-wall pipe.

4,297,168

NUCLEAR FUEL ASSEMBLY AND PROCESS

Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,735
Int. Cl.[3] G21C 3/18
U.S. Cl. 376—418 10 Claims

1. For use in a nuclear reactor, an oxide composition nuclear fuel material in compacted pellet form containing at least one fissionable isotope and an amount of an oxide selected from the group consisting of V_2O_4 and V_2O_5 and mixtures thereof effective to immobilize cadmium resulting from nuclear fission chain reactions of the nuclear fuel material through a reaction between the said cadmium and the said oxide and thereby prevent cadmium embrittlement of nuclear fuel cladding at reactor operating temperatures.

4,297,169

NUCLEAR FUEL ASSEMBLY AND PROCESS

Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,737
Int. Cl.[3] G21C 3/18
U.S. Cl. 376—418 11 Claims

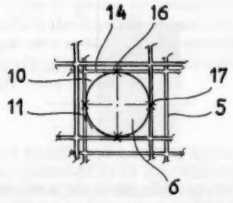
1. For use in a nuclear reactor, an oxide composition nuclear fuel material in compacted pellet form containing at least one fissionable isotope and an amount of a chemical displacement compound selected from the group consisting of $CuFe_2O_4$ and $CuTiO_3$ and mixtures thereof effective to immobilize cadmium resulting from nuclear fission chain reactions of the nuclear fuel material through a reaction between the said cadmium and the said chemical displacement compound and thereby prevent cadmium embrittlement of nuclear fuel cladding at reactor operating temperatures.

4,297,170

DEVICES FOR TRANSVERSELY HOLDING THE FUEL RODS OF A NUCLEAR REACTOR ASSEMBLY

Joseph Leclercq, Le Vesinet, France, assignor to Framatome, Courbevoie, France

Filed May 9, 1979, Ser. No. 37,483
Int. Cl.[3] G21C 3/30
U.S. Cl. 376—442 8 Claims



1. A device for transversely holding the fuel rods of a bundle of fuel rods for a nuclear reactor assembly, which rods are arranged parallel to one another, in a uniform arrangement, having a plurality of support means for exerting forces on the rods in transverse directions to restrict vibrations thereof, while permitting axial lengthening of the rods, each of said support means comprising three sub-units comprising grids arranged adjacent one another in the longitudinal direction of the assembly, said sub-units comprising:

two end grids each formed by small metal plates which are assembled in a uniform network delimiting cells inside which the rods pass, and whose side walls, parallel to the longitudinal axis of the assembly, are formed by said small metal plates arranged transversely, relative to the assembly, so that their width constitutes the thickness of said grid in the longitudinal direction, said end grids being identical and each grid having the same network as the other, each wall of each cell of one grid being located in the same longitudinal plane as the corresponding wall of the other grid, said grids being made integral with one another with a longitudinal spacing along the fuel rods, and

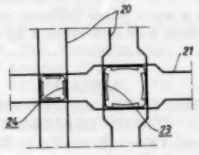
an intermediate grid comprising small, elastic metal plates, the width of which is less than the width of said plates of said end grids, and which are assembled in a uniform network delimiting cells inside which the rods pass and arranged between said end grids in said longitudinal space provided therebetween, in a staggered manner in a transverse direction relative to said end grids, so that two adjacent elastic walls of the cells of said intermediate grid exert on each fuel rods transverse forces which press the rods against two walls of said cells of each end grid, said intermediate grid resting on at least one of said end grids.

4,297,171

NUCLEAR REACTOR FUEL ASSEMBLY

Torsten Olsson, Vesteras, Sweden, assignor to AB ASEA-ATOM, Sweden

Filed Oct. 10, 1979, Ser. No. 83,488
Claims priority, application Sweden, Oct. 13, 1978, 7810686
Int. Cl.[3] G21C 3/30
U.S. Cl. 376—440 6 Claims



1. A nuclear reactor fuel assembly, comprising:

an elongated box;

a plurality of fuel rods vertically disposed within said box, said fuel rods each comprising an upper and lower end plug; and

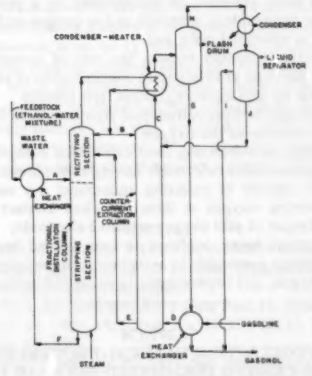
upper and lower grid means disposed within said box for supporting said fuel rods, at least one of said grid means comprising a plurality of prismatic, vertical channels, each one of a first portion of said channels being occupied by an end plug of one said fuel rods, the minimum width of the channels of said first portion being less than the maximum thickness of the associated fuel rod, and a second portion of said channels being open in order to function as coolant channels and further being distributed among the first portion so that each channel of said first portion is surrounded by at least eight adjacent coolant channels of said second portion.

4,297,172

LOW ENERGY PROCESS OF PRODUCING GASOLINE-ETHANOL MIXTURES

Benjamin G. Kyle, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Filed Jan. 23, 1980, Ser. No. 114,699
Int. Cl.[3] B01D 3/14; C07C 29/26, 31/08
U.S. Cl. 203—19 9 Claims



5. The energy saving process of producing gasoline-ethanol mixtures from aqueous ethanol for motor fuel use, comprising:

(a) subjecting aqueous ethanol of 1 to 15 weight percent ethanol to fractional distillation and producing an overhead distillate in vapor form containing 75 to 90 weight

percent ethanol together with at least 10 weight percent water;

(b) condensing said distillate to provide reflux for said distillation column and a feed for a countercurrent multiple stage liquid-liquid extraction column; and without employing an azeotropic ethanol distillation;

(c) thereafter in a separate step subjecting said condensed distillate containing at least said 10% water in said extraction column to extraction with gasoline at a temperature of from 30° to 60° C. and producing a gasoline phase extract and a water phase raffinate, said gasoline extract containing from 8 to 14% ethanol by weight.

4,297,173

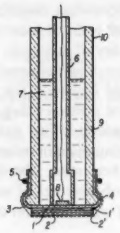
METHOD FOR DETERMINING AMMONIA AND SENSOR THEREFOR

Motohiko Hikuma; Tatsuru Kubo; Takeo Yasuda, all of Yokohama; Isao Karube, Tachikawa, and Shuichi Suzuki, Tokyo, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,177

Int. Cl.³ C12Q *1/00*; G01N *27/30*

U.S. Cl. 204—1 T **15 Claims**



1. A method for determining ammonia concentration in an aqueous liquid which contains dissolved oxygen, which comprises:

(a) Contacting a sample of said liquid with a microbial electrode comprising:

an oxygen-sensitive electrode having a diaphragm,

bacteria capable of oxidizing ammonium ion and thereby consuming oxygen in direct or close contact with the diaphragm of said oxygen sensitive electrode, said bacteria being confined or immobilized by a porous membrane permeable to ammonia and to oxygen and impermeable to microbial cells; and

(b) electrochemically sensing the rate of consumption or their decrease in steady state concentration of said oxygen caused by said microorganisms, and thereby

(c) detecting the concentration of ammonia from said rate or said decrease of the oxygen.

9. An ammonia-detecting electrode which comprises:

an oxygen-sensitive electrode having a diaphragm;

bacteria capable of oxidizing ammonium ion and thereby consuming oxygen in direct or close contact with the diaphragm of said oxygen sensitive electrode;

said bacteria being confined or immobilized by a porous membrane permeable to ammonia or ammonium ions and to oxygen, and impermeable to microbial cells.

4,297,174

PYROELECTROCHEMICAL PROCESS FOR REPROCESSING IRRADIATED NUCLEAR FUELS

Giovanni Brambilla, Stagno, and Adelmo Sartorelli, Forli', both of Italy, assignors to Agip Nucleare, S.p.A., Rome, Italy

Filed Mar. 8, 1979, Ser. No. 18,730

Int. Cl.³ C25C *1/22*

U.S. Cl. 204—1.5 **7 Claims**

1. A pyroelectrochemical method for the reprocessing of irradiated nuclear fuels coming preferably from fast reactors, characterized in that it comprises the steps of:

(a) dissolving the nuclear fuel, containing fission products, in a bath comprising molten alkali metal sulfates,

(b) thermally decomposing the plutonium sulfate, $Pu(SO_4)_2$, formed in said molten bath to plutonium oxide, PuO_2,

(c) electrodepositing uranium oxide on the cathode of an electrolytic cell provided in said molten bath,

(d) recycling the melted sulfates of said molten bath to the start of the process, and

(e) conditioning said fission products and said melted sulfates.

4,297,175

PROCESS FOR PARTIALLY ELECTROPLATING FLAT SILVER

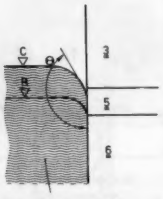
Hans Schlegel, Ulm, and Theodor Nowotny, Geislingen, both of Fed. Rep. of Germany, assignors to Wurttembergische Metallwarenfabrik, Geislingen, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 214,252

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006569

Int. Cl.³ C25D *5/00, 5/02*; B21K *11/02*

U.S. Cl. 204—15 **8 Claims**



1. a process for partially silver electroplating a flat silver part, the part including two metal components to be joined lengthwise, the first component to be covered with a plating-resistant dipping enamel and the second component to be electroplated with silver, the process comprising the steps of:

(a) joining lengthwise the said two metal components;

(b) providing a thin separation surface between exposed surfaces of said two components, said separation surface consisting of a material which is more difficult to wet with the dipping enamel than the metal of the first component to be covered;

(c) dipping said first component into said enamel until contact is achieved between said enamel and said separation surface; and

(d) silver electroplating said second component.

4,297,176

SURFACE PASSIVATION OF COMPOUND SEMICONDUCTORS

Stephen J. Hannah, Cockermouth, and Bryan Livingstone, Felling, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 27, 1980, Ser. No. 125,048

Claims priority, application United Kingdom, Mar. 9, 1979, 08453/79

Int. Cl.³ C25D *11/32*

U.S. Cl. 204—37 R **17 Claims**

1. A method of surface-passivating a compound semiconductor whose elements are differently volatile, comprising the steps of (a) anodising a compound semiconductor to produce a layer thereon of native semiconductor oxide, (b) reducing all of the layer of oxide at elevated temperature and allowing the more volatile element of the reduced oxide to evaporate away, to leave predominantly the less volatile element overlying the

compound semiconductor, (c) depositing an anodisable metal on the surface of the less volatile element, (d) re-anodising the resulting structure until oxidation has proceeded to beyond the layer containing predominantly the less volatile element and from 10 A to 50 A into the compound semiconductor, and optionally at any suitable stage (e) applying an ohmic contact to the back surface of the compound semiconductor or selectively to the top surface as required.

4,297,177

METHOD AND COMPOSITION FOR ELECTRODEPOSITING PALLADIUM/NICKEL ALLOYS

Augustus Fletcher, Bristol, and William L. Moriarty, South Meriden, both of Conn., assignors to American Chemical & Refining Company Incorporated, Waterbury, Conn.

Filed Sep. 19, 1980, Ser. No. 188,977
Int. Cl.³ C25D *3/56*
U.S. Cl. 204—43 N **8 Claims**

1. In an aqueous bath for producing bright and relatively stress-free electroplate of palladium/nickel alloy, the combination, expressed as gram moles per liter, comprising: 0.01 to 0.25 of palladium ion; 0.015 to 0.85 of nickel ion; 0.15 to 1.5 of a soluble electrolyte selected from the group consisting of alkali metal and ammonium sulfates, sulfamates, phosphates, nitrates, nitrites, and mixtures thereof; 0.005 to 0.15 of a saccharin or soluble saccharate stress reducer; 1.5×10^{-4} to 10×10^{-4} of 3-butyne-2-ol brightener; up to 6×10^{-4} of cetyltrimethylammonium bromide; up to an effective amount of ammonium hydroxide; and water to volume, said palladium and nickel ions being substantially in the form of ammino complexes, and said bath having a pH of 7 to 11, with said amount of ammonium hydroxide being effective to insure said complexed state of said ions and said pH value of said bath.

4,297,178

RUTHENIUM ELECTROPLATING AND BATHS AND COMPOSITIONS THEREFOR

Jeffrey N. Crosby, Worcester, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Apr. 9, 1980, Ser. No. 138,786
Claims priority, application United Kingdom, Apr. 10, 1979, 12648/79
Int. Cl.³ G01N *3/52*; C07F *17/02*
U.S. Cl. 204—47 **34 Claims**

22. A composition of matter adapted to be used in aqueous solution as an electroplating bath comprising as components:

(a) a ruthenium-containing material having two ruthenium atoms linked by a nitrogen bridge atom, and

(b) a water-soluble compound from the group oxalic acid, alkali metal salts of oxalic acid and alkali metal acid salts of oxalic acid.

24. An aqueous bath for electrodepositing ruthenium consisting essentially of as components:

a. a ruthenium-containing material having two ruthenium atoms linked by a nitrogen bridge atom, and

b. a water-soluble compound selected from the group consisting of a dibasic carboxylic acid, alkali metal salts of such acid, and alkali metal acid salts of such acid;

said bath having a pH in the range of above 4 up to about 10.

4,297,179

PALLADIUM ELECTROPLATING BATH AND PROCESS

Robert M. Skomoroski, Paterson, N.J., assignor to American Chemical & Refining Company Incorporated, Waterbury, Conn.

Filed Sep. 2, 1980, Ser. No. 183,318
Int. Cl.³ C25D *3/52*
U.S. Cl. 204—47 **11 Claims**

1. An aqueous alkaline bath for the electrodeposition of palladium, comprising:

(a) about 0.035 to 0.4 gram mole per liter of palladium ion;

(b) at least about 1.5 gram moles per liter of ammonium radical;

(c) about 1.25×10^{-5} to 125×10^{-5} gram mole per liter of 3-butyne-2-ol as a brightener; and

(d) at least 0.1 gram mole of electrolyte per liter;

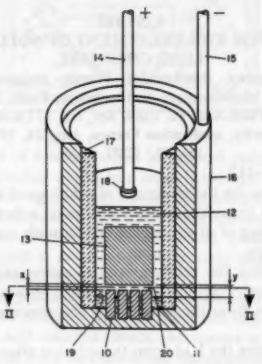
said bath having a pH of about 9 to 11.5, and being free of cyanide radical.

4,297,180

ELECTROLYTIC PRODUCTION OF METAL

Perry A. Foster, Jr., New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 717,700, Aug. 25, 1976, Pat. No. 4,219,391, which is a continuation-in-part of Ser. No. 645,533, Dec. 21, 1975, abandoned. This application Sep. 26, 1979, Ser. No. 79,025
Int. Cl.³ C25C *3/06, 3/00*
U.S. Cl. 204—67 **13 Claims**



1. A method for the electrolytic production of metal, including electrolyzing, between anodic and cathodic surface areas, a compound of the metal dissolved in a molten solvent, the electrolyzing being performed at a temperature such that the metal is formed in the molten state, the metal collecting in a molten metal pad, the anodic surface area being formed by at least one anode block, wherein the improvement comprises the provision of cathodic surface area in the form of an array of islands protruding out of the pad into the solvent toward said block for establishing a series of locations at which the anode-cathode distance is up to 1¼ inches, whereby anode-cathode distances less than the distance separating the metal pad from the anode block are achieved without hindrance from magnetic turbulence in the metal pad, the voltage drop experienced in the solvent becomes less than it would be in the absence of the islands, and replenishment of the dissolved compound is improved over what it would be with a planar cathode.

4,297,181

PROCESS FOR PREPARING KETONES

Tatsuya Shono, 13, Ichikawacho 1-chome, Kamitakano, Sakyo-ku, Kyoto-shi, Kyoto 606, Japan

PCT No. PCT/JP79/00257, § 371 Date Jun. 11, 1980, § 102(e) Date Jun. 11, 1980, PCT Pub. No. WO80/00714, PCT Pub. Date Apr. 17, 1980
PCT Filed Oct. 11, 1979, Ser. No. 198,958
Claims priority, application Japan, Oct. 11, 1978, 53-125406
Int. Cl.³ C25B *3/02*
U.S. Cl. 204—78 **6 Claims**

1. Process for preparing a ketone, characterized in that a secondary alcohol is subjected to a catalytic electrode oxidation in the presence of iodine or/and an iodine compound.

4,297,182

PRODUCTION OF ALKALI METAL HYDROXIDE

Yoshio Oda; Takeshi Morimoto, and Kohji Suzuki, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,401
Claims priority, application Japan, May 4, 1979, 54-54040
Int. Cl.[3] C25B *1/34, 11/03, 11/06, 13/08*
U.S. Cl. 204—98 7 Claims

1. In a process for producing an alkali metal hydroxide by electrolyzing an aqueous solution of an alkali metal chloride by using a gas and liquid-permeable cathode bonded on an ion-exchange membrane, the improvement wherein said gas and liquid permeable cathode consists essentially of a nickel containing powder selected from the group consisting of a thermally decomposed nickel obtained from a nickel salt of fatty acid; Raney nickel; stabilized Raney nickel; and carbonyl nickel and a polytetrafluoroethylene.

4,297,183

PROCESS FOR THE TREATMENT OF SOLUTIONS OF LEAD CHLORIDE

André Georgeaux, Rambouillet, France, assignor to Societe Miniere et Metallurgique de Penarroya, Paris, France

Filed Aug. 12, 1980, Ser. No. 177,434
Claims priority, application France, Aug. 24, 1979, 79 21325
Int. Cl.[3] C25L *1/18*
U.S. Cl. 204—117 13 Claims

1. A process for the treatment of solutions of lead chloride containing as impurities at least one metal selected from the group consisting of silver, copper and bismuth, comprising the following steps:

(a) contacting the solution with a cation exchange resin whose active group is a sulfhydryl group to separate impurities from the solution by absorption on the resin; and

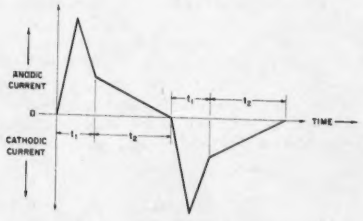
(b) recovering the lead from the solution after the solution has contacted the resin in step (a).

4,297,184

METHOD OF ETCHING ALUMINUM

Christopher K. Dyer, Summit, N.J., assignor to United Chemi-Con, Inc., Rosemont, Ill.

Filed Feb. 19, 1980, Ser. No. 122,460
Int. Cl.[3] C25F *3/04*
U.S. Cl. 204—129.4 7 Claims



1. In a method of etching aluminum by applying an alternating electric current to aluminum which is in contact with an electrolyte containing hydrochloric acid, the improvement in which the alternating current has a wave form wherein the current rises rapidly from zero to a maximum, then subsequently decreases rapidly in a first stage to an intermediate value which is about one-third to about one-half of the maximum, and thereafter decreases more slowly to zero in a second stage, the ratio of time of the second stage to time of the first stage being in the range from 1 to 6, whereby higher capacitance values of the etched aluminum are obtained.

4,297,185

PHOTOSETTING ADHESIVE FROM UNSATURATED OLIGOMER, PHOTOINITIATOR, AND BETAINE-FORMING MIXTURE OF UNSATURATED TERT.AMINE AND UNSATURATED ACID

Pierre Chevreux, St Jean De Gonv, France; Van-Tao Nguyen, Petit-Lancy, Switzerland; Alain Roman, Bossey, France, and Daniel Turpin, Nyon, Switzerland, assignors to Techinter S.A., Geneva, Switzerland

Filed Sep. 18, 1979, Ser. No. 76,780
Claims priority, application Switzerland, Sep. 20, 1978, 9815/78
Int. Cl.[3] C08F *2/50, 220/28;* C08L *75/04;* B32B *27/16*
U.S. Cl. 204—159.15 16 Claims

1. A photohardenable composition polymerizable by irradiation under u.v. light to provide an adhesive and including:

(A) at least one olefinic photopolymerizable prepolymer having an olefinic double bond activated by an electrophilic substituent, and

(B) a polymerization photoinitiator, characterised in that the composition also includes

(C) a substituted or unsubstituted aliphatic or cycloaliphatic N,N-dialkylamino alcohol ester of an α,β-ethylenically unsaturated carboxylic acid, said alcohol having an alkylene moiety of up to six carbon atoms between the hydroxy and the amino functions, and

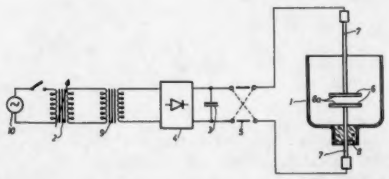
(D) an α,β-ethylenically unsaturated carboxylic acid in an amount equal to one mole per mole of C, (C) and (D) being capable of reacting together to form a betaine, and said oligomer or prepolymer (A) is an ester of an α,β-ethylenically unsaturated acid and a hydroxylated product containing urethane and/or urea links in the molecule thereof and having a molecular weight from about 500 to 10,000.

4,297,186

METHOD AND APPARATUS FOR REDUCING THE ACTIVATION ENERGY OF CHEMICAL REACTIONS

Walter HP Killer, Burghalde 10, Lenzburg, Switzerland

Continuation of Ser. No. 775,229, Mar. 7, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,100
Claims priority, application Switzerland, Mar. 16, 1976, 3292/76
Int. Cl.[3] C08F *2/52*
U.S. Cl. 204—165 9 Claims



1. A method of reducing the activation energy of polymerization reactions between organic molecules selected from the group consisting of olefins, dienes, O-vinyl compounds, halogenated hydrocarbons and aldehydes; and of polymerization reactions or aldol condensation reactions between molecules of benzaldehyde and acetophenone, comprising the steps of:

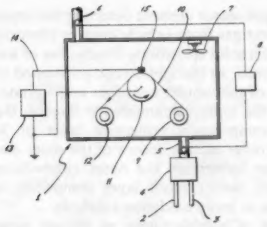
producing an electrically non-conducting, liquid phase containing an educt; generating an electrostatic field by means of a capacitor arrangement in said phase with electrodes of which at least one comprises an electrically insulating surface layer consisting of an insulating metal oxide or metal chloride compound; and polymerizing or condensing said molecules.

4,297,187

SURFACE TREATMENT OF PLASTIC MATERIAL

Yukichi Deguchi; Hideki Yamagishi, and Shunichiro Kirimura, all of Tokyo, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,271
Claims priority, application Japan, Oct. 5, 1978, 53-123013
Int. Cl.³ C08F *2/52*
U.S. Cl. 204—165 **8 Claims**



1. In a process for treating the surface of a plastic material, the step which comprises subjecting the surface of the material to corona discharge in contact with a mixed gas which substantially consists of nitrogen and carbon dioxide, the volume of nitrogen to carbon dioxide in said mixed gas being in the range of 99.5:0.5 to 50:50.

4,297,188

PROCESS FOR THE ELECTROLYTIC COATING OF CONDUCTIVE SUBSTRATES WITH PROTECTIVE FILMS OF PHENOLIC RESINS

Sergio Daolio, Luzzara; Guiliano Mengoli, Padua; Carlo Folonari, Turin, and Marco Musiani, Casalecchio di Reno, all of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano and Consiglio Nazionale Delle Richerche, Rome, both of, Italy

Filed Sep. 23, 1980, Ser. No. 189,989
Claims priority, application Italy, Sep. 24, 1979, 68853 A/79
Int. Cl.³ C25D *13/08*
U.S. Cl. 204—181 R **13 Claims**

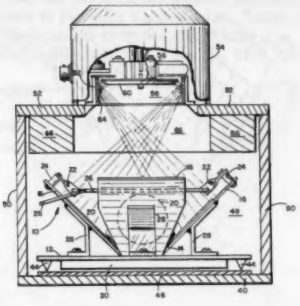
1. A process for coating a conductive substrate used as the anode in an electrochemical cell in which a direct electric current is passed from a cathode to the said anode through an electrolytic liquid containing one or more phenolic monomers to form a polymeric film of phenolic resin on the substrate, which comprises using an electrolyte which includes from 10 to 200 g/l of phenolic monomer consisting of allylphenol or a mixture thereof with one or more other phenols, and from 5 to 200 g/l of an aliphatic amine, in solution in a mixture of water and alcohol in a volume ratio of from 20:1 to 0.05:1, forming the polymeric film by using an electric current of density not greater than 50 mA/cm^2 of substrate, and heating the polymeric film thus deposited at a temperature of from 100° to 200° C. to induce hardening of the said resin.

4,297,189

DEPOSITION OF ORDERED CRYSTALLINE FILMS

Elroy C. Smith, Jr., La Habra, and Shi K. Yao, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 27, 1980, Ser. No. 163,532
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 SP **29 Claims**



13. A method of forming a film of ordered polycrystalline material on a selected object in a cross-field radio frequency magnetron sputtering chamber having sputtering elements in the ceiling thereof, said method comprising the steps of:

orienting a line normal to the deposition surface of said selected object at an angle of about sixty degrees away from the vertical; and

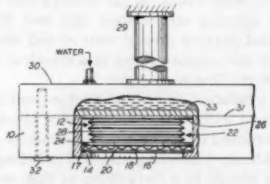
deflecting charged particles away from said selected object by means of a positively charged electrode disposed in the vicinity of said selected object and spaced a significant distance away from said sputtering elements, wherein said electrode is electrically isolated from said sputtering elements.

4,297,190

METHOD FOR REMOVING HEAT FROM A WORKPIECE DURING PROCESSING IN A VACUUM CHAMBER

Robert W. Garrett, Reading, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 38,741, May 14, 1979. This application Dec. 1, 1980, Ser. No. 211,603
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 E **5 Claims**

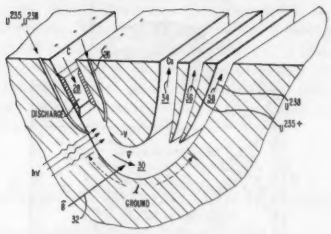


1. In a sputter etch process performed on a workpiece in an RF sputtering chamber wherein a highly conductive thermal path is provided between the workpiece and a cold plate and the workpiece is held securely in place during the sputtering operation, the improvement comprising using an expandable heat pipe for providing a highly conductive thermal path from the workpiece to a cold plate.

4,297,191
ISOTOPIC SEPARATION

Cheng-Lin Chen, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 864,344, Dec. 27, 1977. This application Aug. 30, 1979, Ser. No. 70,939
Int. Cl.[3] B01D *59/00*
U.S. Cl. 204—193 2 Claims



1. Apparatus for separating isotopes in an isotopic mixture having a first species including a first isotope of a particular element and a second species including a second isotope of said element, said apparatus comprising:

structure defining a flow passage, said passage serially including means for inletting a flowing gas, means for passing said inletted flowing gas through a curved centrifuge section having an inner radius of curvature and an outer radius of curvature, and means for segmenting said passage into a plurality of outlets including an inner segment disposed toward said inner radius and an outer segment disposed toward said outer radius;

means for creating a magnetic field within said centrifuge section;

means for creating a discharge zone between said gas inlet means and said centrifuge section;

means for injecting said mixture in a gaseous phase into said flow passage downstream of said discharge means; and

means for irradiating said injected mixture between said injecting means and at least a portion of said centrifuge section so as to selectively excite said first species.

2. Apparatus for separating isotopes in an isotopic mixture having a first species including a first isotope of a particular element and a second species including a second isotope of said element, said apparatus comprising:

means for creating an electrical discharge zone;

means for flowing a selected gas through said zone;

means for injecting said mixture into said flowing gas a preselected distance downstream of said discharge zone such that said mixture flows in a direction substantially similar to the flow of said gas;

means for irradiating said mixture subsequent to said injection so as to selectively excite said first species and cause a predetermined release of reaction products, some of said products being of differing mass and including a species of said first isotope in a form different than its initial form prior to said irradiation;

curved means for deflecting said products of differing mass along differing flow paths;

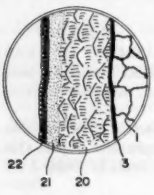
means for creating a magnetic field in the region of said curved deflecting means; and

means for collecting said deflected products including a segment for collecting said species of said first isotope in a different form.

4,297,192
CATALYST SUPPORTED OXYGEN SENSOR ELEMENT AND A METHOD OF MANUFACTURING SAME

Hiroshi Shinohara, Okazaki; Yasuhiro Otsuka, Toyota; Shinichi Matsumoto, Toyota; Hiroshi Wakisaka, Toyota, and Toshinobu Furutani, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 18, 1979, Ser. No. 104,966
Int. Cl.[3] B05D *1/08;* G01N *27/58*
U.S. Cl. 204—195 S 12 Claims



1. In an oxygen sensor element detecting the oxygen concentration in exhaust gas from vehicle engines comprising a tubular container of a solid electrolyte conductive of ions with one end portion closed, an inner electrode positioned on the inner circumference of the tubular container and an outer electrode positioned on the outer circumference thereof, the improvement which comprises a protective layer of $MgO.Al_2O_3$ formed on the outer circumference of the outer electrode and a catalyst layer formed on the outer circumference of the protective layer, said catalyst layer comprising an alumina carrier and one or more oxidation catalysts.

9. A method of manufacturing an oxygen sensor element which comprises the steps of; forming an inner electrode on the inner circumference of a tubular container of a solid electrolyte conductive of ion with one terminal portion closed and an outer electrode on the outer circumference thereof; forming a protective layer of $MgO.Al_2O_3$ on the outer circumference of the outer electrode by flame spraying; and thereafter forming a catalyst layer on the outer circumference of the protective layer by applying an aqueous slurry comprising an alumina carrier, an oxidation catalyst and binder, followed by drying and burning.

4,297,193
PH ELECTRODE GLASS COMPOSITIONS

Donald P. Brezinski, Corning, and Leroy R. Morse, Campbell, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 22, 1980, Ser. No. 152,358
Int. Cl.[3] G01N *27/36;* C03C *3/04*
U.S. Cl. 204—195 G 22 Claims

1. A glass composition for use in pH-responsive glass electrodes consisting essentially of (in mole percent on the oxide basis):

a. from about 30 to about 37 mole percent Li_2O;

b. from 0 to about 4 mole percent of at least one oxide selected from the group consisting of Cs_2O and Rb_2O;

c. from about 2 to about 12 mole percent of at least one oxide selected from the group consisting of La_2O_3 and Pr_2O_3;

d. from about 2 to about 10 mole percent of at least one oxide selected from the group consisting of Ta_2O_5 and Nb_2O_5;

e. from 0 to about 4 mole percent UO_2; and

f. the balance SiO_2;

with the proviso that there is present in the composition at least about 2 mole percent of at least one oxide selected from the group consisting of Pr_2O_3 and Nb_2O_5.

12. A glass electrode having a pH-responsive membrane of glass having a composition consisting essentially of (in mole percent on the oxide basis):

a. from about 30 to about 37 mole percent Li_2O;

b. from 0 to about 4 mole percent of at least one oxide selected from the group consisting of Cs_2O and Rb_2O;
c. from about 2 to about 12 mole percent of at least one oxide selected from the group consisting of La_2O_3 and Pr_2O_3;
d. from about 2 to about 10 mole percent of at least one oxide selected from the group consisting of Ta_2O_5 and Nb_2O_5;
e. from 0 to about 4 mole percent UO_2; and
f. the balance SiO_2;

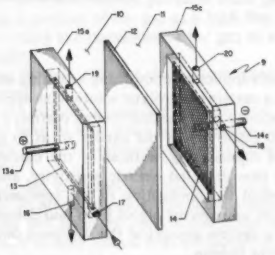
with the proviso that there is present in the composition at least about 2 mole percent of at least one oxide selected from the group consisting of Pr_2O_3 and Nb_2O_5.

4,297,194

ELECTROLYTIC PRODUCTION OF HIGH PURITY ALKALI METAL HYDROXIDE

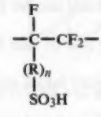
Ronald L. Dotson, Mentor, and Kevin J. O'Leary, Cleveland Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 191,424, Oct. 21, 1971, Pat. No. 4,025,405. This application Feb. 16, 1977, Ser. No. 769,098
Int. Cl.³ C25B 9/00
U.S. Cl. 204—257 **5 Claims**



1. An electrolytic cell for the production of aqueous alkali metal hydroxide solution substantially free of alkali metal halide and other impurities comprising

(1) a first hollow cell section having disposed therein a dimensionally stable anode, an electrolyte inlet, a spent electrolyte outlet, a halogen gas outlet and electrical connection means for supplying current to said anode;
(2) a second hollow cell section having disposed therein a metal cathode, an outlet for the aqueous solution of alkali metal hydroxide product, an outlet for hydrogen gas and electrical connection means for conducting current from said cathode; and
(3) a hydrated fluorinated copolymer cationic exchange resin film membrane having pendant sulfonic acid groups or derivatives thereof arranged between said hollow cell sections closely spaced between a surface of each said anode and said cathode and held in fixed juxtaposed position by said hollow cell sections, said film membrane having the structural formula:



(1)

and

(2) $-CXX'-CF_2-$

wherein R represents the group

$$-CF-CF_2-O-CFY-CF_2O)_m$$

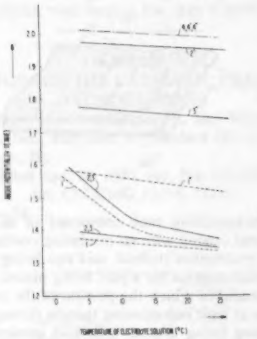
in which R' is fluorine or perfluoralkyl of 1 to 10 carbon atoms, Y is fluorine or trifluoromethyl, and m is 1, 2 or 3, n is 0 or 1; X is fluorine, chlorine, hydrogen or trifluoromethyl; and X' is X or $CF_3-CF_2)_z$ wherein z is 0 or an integer from 1 to 50; the units of formula (1) being present in an amount from 3 to 20 mole percent.

4,297,195

ELECTRODE FOR USE IN ELECTROLYSIS AND PROCESS FOR PRODUCTION THEREOF

Hideo Sato, Chiba, and Takayuki Shimamune, Ichihara, both of Japan, assignors to Permelec Electrode Ltd., Tokyo, Japan

Filed Sep. 20, 1979, Ser. No. 77,224
Claims priority, application Japan, Sep. 22, 1978, 53-115894
Int. Cl.³ C25B 11/08
U.S. Cl. 204—290 F **2 Claims**



1. An electrode for use in the electrolysis of an aqueous solution of a metal halide, said electrode comprising an electrically conductive substrate and, formed thereon, a coating comprising

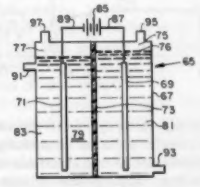
(1) 50 to 95 mole % of the platinum and
(2) (a) 5 to 50 mole % of tin oxide, or
(b) 5 to 50 mole % of tin oxide and cobalt oxide wherein the tin oxide is present in an amount of at least 5 mole % and the cobalt oxide is present in an amount up to 20 mole %, the total of (1) and (2) being 100 mole %.

4,297,196

STABLE LOW VOLTAGE MICROPOROUS DIAPHRAGM FOR ELECTROLYTIC CELLS

Christine A. Lazarz, and Edward H. Cook, Jr., both of Niagara Falls, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,766
Int. Cl.³ C25B 13/04, 13/08
U.S. Cl. 204—296 **8 Claims**



1. A microporous synthetic organic polymeric sheet, useful for the manufacture of a stable low voltage separator for an electrolytic cell, of a thickness in the range of about 0.2 to 2 mm., a porosity in the range of about 70 to 90% and of pore sizes substantially all within the range of 1 millimicron to 1 millimeter in diameter, with over 90% of the volume of the

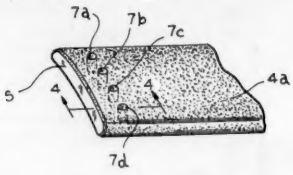
pores, by porosimeter analysis, being of pores in the range of 0.1 to 100 microns in diameter and with over 80% of the volume of the pores being in pores in the range of 0.12 to 33 microns in diameter, and with the ratio of the number of pores in the 0.09 to 0.3 micron diameter range to the number of pores in the 0.8 to 20 micron diameter range being less than about 50.

4,297,197

ELECTROPLATING RACK

Syed Salman, Sterling Heights, Mich., assignor to International Telephone and Telegraph Corp., New York, N.Y.

Filed Nov. 13, 1980, Ser. No. 206,400
Int. Cl.³ C25D *17/08*
U.S. Cl. 204—297 W **6 Claims**



1. In an electroplating rack composed of an electrically conductive metal coated with an insulating coating, said rack having tips at extremities thereof, said tips being uncoated to provide electrical contact for a part being plated,

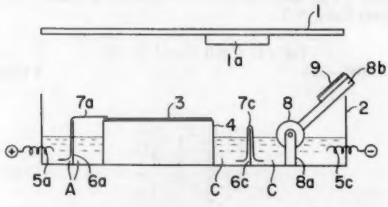
the improvement in which the portion of the rack adjacent the tip has at least one opening therein through said rack, said opening being coated with said insulating coating, such that a continuous coating is formed with the coating on the opposite surfaces of said portion of the rack.

4,297,198

CONCENTRATING ELECTROPHORESIS APPARATUS

Mochihiko Ohashi, 2-33-16-507, Tokiwadai, Itabashi-ku, Tokyo, and Tosifusa Toda, 2-6-4, Shinpo-cho, Higashikurume-shi, Tokyo, both of Japan

PCT No. PCT/JP79/00137, § 371 Date Jan. 8, 1980, § 102(e) Date Jan. 8, 1980, PCT Pub. No. WO79/01141, PCT Pub. Date Dec. 27, 1979
PCT Filed May 29, 1979, Ser. No. 190,869
Claims priority, application Japan, May 29, 1978, 53-64307
Int. Cl.³ G01N *27/26*; C25B *7/00*
U.S. Cl. 204—299 R **11 Claims**



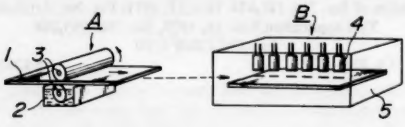
1. A concentrating electrophoresis apparatus comprising: supply means for a buffer solution containing terminating ions and electrically connected to one electrode of a direct-current or alternating-current superposed direct-current electric power source; a supporting medium for separation electrically connected to the other electrode of the power source and comprising a water-retentive membrane or sheet material wetted with a buffer solution containing leading ions; a supporting medium for concentration comprising a water-retentive membrane material wetted with a buffer solution containing leading ions and having a pH different from that of the buffer solution wetting the supporting medium for separation; and a movable mechanism for causing the supporting medium for concentration at its one end to contact the supply means and at its other end to contact the supporting medium for separation and imparting electrical connection through these supply means, supporting medium for concentration, and supporting medium for separation.

4,297,199

SPECIMEN APPLICATOR

Kazuo Hijikata, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 12, 1980, Ser. No. 210,512
Claims priority, application Japan, Nov. 14, 1979, 54-146386
Int. Cl.³ G01N *27/26*
U.S. Cl. 204—299 R **5 Claims**



1. A specimen applicator comprising a wetting means to wet a carrier with a certain electrolytic solution, an applying means to apply a specimen onto the thus wetted carrier, a detector to detect electric resistivity of the carrier so as to generate an electric signal representing wetness of the carrier as determined by the thus detected electric resistivity, and a control means to control the application of the specimen onto the carrier based on said electric signal from said detector so as to always apply a certain amount of the specimen onto said carrier in a uniform fashion.

4,297,200

METHOD FOR HYDROCONVERSION OF SOLID CARBONACEOUS MATERIALS

Patrick B. Briley, 131 Lee La., Bolingbrook, Ill. 60439

Filed Jan. 18, 1980, Ser. No. 113,222
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **42 Claims**

1. A process for hydroconversion of solid carbonaceous materials comprising the steps of:

contacting in a dissolution zone particulate solid carbonaceous material with a hydrocarbon solvent;

removing from said dissolution zone a first stream containing hydrocarbon liquids, hydrocarbon gases, and particulate carbonaceous material;

separating said first stream into a second stream and a third stream, said second stream consisting substantially of gas phase material;

separating with a solids separation device said third stream into a fourth stream and a fifth stream, said fourth stream having an average solid size smaller than the average solid size in said fifth stream;

introducing at least a portion of said fifth stream into said dissolution zone;

separating said fourth stream into a sixth stream and a seventh stream;

introducing at least a portion of said seventh stream into said third stream;

adding molecular hydrogen to said sixth stream;

heating said sixth stream;

introducing said sixth stream into a catalytic hydrogenation zone;

removing from said catalytic hydrogenation zone an eighth stream;

separating said eighth stream into a ninth stream and a tenth

stream, said ninth stream consisting substantially of gas phase materials;

introducing at least a portion of said tenth stream into said fourth stream; and

repeating the above steps until the desired amount of hydroconversion is achieved.

4,297,201

PROCESS FOR OIL SHALE RETORTING

John B. Jones, and S. Kumar Kunchal, both of 300 Enterprise Bldg., Grand Junction, Colo. 80501

Filed Jan. 3, 1978, Ser. No. 866,358

Int. Cl.³ C10G *1/00;* **C10B** *21/18, 47/20, 57/12*

U.S. Cl. 208—11 R **6 Claims**

1. A continuous process for the recovery of energy containing products from oil shale consisting essentially of:

(a) retorting a particulate oil shale in a separated retort vessel by injecting a heated, generally non-oxygenous recycle gas, from retorting oil shale, into a bed of such oil shale in the retort vessel;

(b) withdrawing gas and products of retorting from said retort vessel, and withdrawing hot retorted shale containing carbon residue from said separated retort vessel;

(c) passing said gas and products of retorting to a separation process to remove liquid products from gas, and withdrawing a portion of the gas as a high Btu product gas, and recycling the remainder of the gas to a second heat exchanger;

(d) passing the hot, retorted shale into a separated combustion vessel;

(e) injecting oxygen containing gas into said hot retorted shale to burn at least some of the carbon residue to produce hot gases of combustion and retorted and spent shale as waste;

(f) passing said hot gases of combustion to a first heat exchanger to produce high temperature steam, and

(g) passing hot gases of combustion from said first heat exchanger to said second heat exchanger to heat recycle gas passing into said retort vessel.

4,297,202

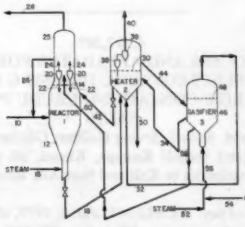
TWO-STAGE INTEGRATED COKING FOR CHEMICALS AND COKE GASIFICATION PROCESS

Don E. Blaser, Randolph, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 789,569, Apr. 21, 1977, abandoned. This application Jul. 5, 1978, Ser. No. 922,044

Int. Cl.³ C10G *9/28, 37/06*

U.S. Cl. 208—54 **10 Claims**



1. In an integrated coking and gasification process comprising the steps of:

(a) reacting a carbonaceous material having a Conradson carbon content of at least 10 weight percent in a coking zone containing a bed of fluidized solids maintained at fluid coking conditions including a temperature ranging from about 850° F. to about 1195° F., to form a vaporous coking zone conversion product and coke, said coke depositing on said fluidized solids;

(b) introducing a portion of said solids with the coke deposition thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids;

(c) recycling a first portion of heated solids from said heating zone to said coking zone and introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature greater than the temperature of said heating zone, and

(d) passing said vaporous coking zone conversion product with entrained solids to a gas-solids separation zone, the improvement which comprises withdrawing a portion of solids from the gasification zone and introducing said portion of solids into said gas-solids separation zone in an amount sufficient to maintain said gas-solids separation zone at a temperature in the range of about 1200 to about 1700 degrees Fahrenheit to convert at least 20 weight percent of the coking zone vaporous product to unsaturated hydrocarbons having less than 6 carbon atoms.

4,297,203

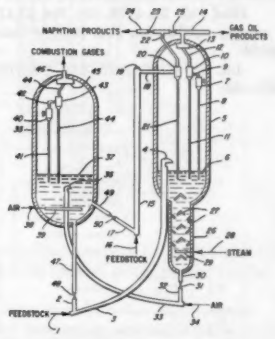
APPARATUS FOR THE CATALYTIC CRACKING OF HYDROCARBONS

William D. Ford, Downers Grove, Ill., and Michael J. Clark, Chesterton, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 14, 1980, Ser. No. 139,894

Int. Cl.³ C10G *11/18, 51/06*

U.S. Cl. 208—74 **14 Claims**



1. In a fluidized catalytic cracking system comprising in combination a spent catalyst stripper, a spent catalyst regenerator, and multiple reactors, apparatus for the fluidized catalytic cracking of hydrocarbon feedstocks in multiple reactors comprising:

(a) a first elongated transfer line reactor which is adapted for the fluid catalytic cracking of hydrocarbon feedstock, having an upper and lower end, said lower end having both a regenerated catalyst inlet means and a hydrocarbon feedstock inlet means;

(b) a reactor vessel communicating with and enclosing the upper end of said first transfer line reactor;

(c) an outlet means for removing spent catalyst from the lower portions of said vessel;

(d) a first cyclone separation system located within said vessel and adapted to separate catalyst particles from vapors, which comprises at least one cyclone gas-solids separation means having a dip-leg depending therefrom;

(e) a vapor outlet means connected to said first cyclone separation system;

(f) a second elongated transfer line reactor which is adapted for the fluidized catalytic cracking of hydrocarbon feedstock, having an upper and lower end, said lower end having both a regenerated catalyst inlet means and a hydrocarbon feedstock inlet means;

(g) a separate conduit leading to each hydrocarbon feedstock inlet means, whereby the same or different feedstocks can be conveyed to each transfer line reactor;

(h) a second cyclone separation system located within said vessel, directly connected by an inlet means to the upper end of said second transfer line reactor, and adapted to separate the mixture of catalyst particles and vapors which is discharged from said second transfer line reactor, wherein said second cyclone separation system comprises at least one cyclone gas-solids separation means having a dip-leg depending therefrom, and whereby the vapors from said second transfer line reactor are substantially separated and prevented from entering said vessel and catalyst from the second transfer line reactor is separated and passed into said vessel;

(i) a vapor outlet means connected to the second cyclone separation system; and

(j) a separate conduit leading from the vapor outlet means associated with each cyclone separation system, whereby the vapors from each vapor outlet means can be conveyed to a separate product recovery system.

4,297,204

THERMAL CRACKING WITH POST HYDROGENATION AND RECYCLE OF HEAVY FRACTIONS

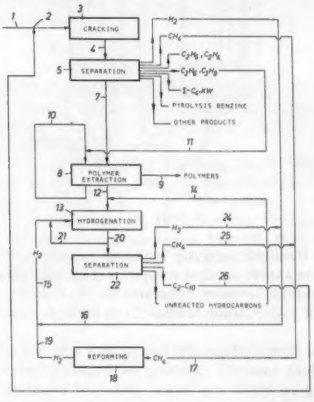
Claus Schliebener, Strasslach, and Hans J. Wernicke, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegeiskreuth, United Kingdom

Filed Feb. 21, 1979, Ser. No. 13,110

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806854

Int. Cl.³ C10G *9/16, 53/04, 69/06*

U.S. Cl. 208—95 **9 Claims**



1. In a process for the thermal cracking of unhydrogenated hydrocarbon feedstock to produce normally gaseous olefins, the improvement which comprises fractionating the hydrocarbons from the thermal cracking stage into a pyrolysis fuel oil cut boiling above 200° C. and a cut boiling below 200° C., separating polymeric compounds, which have been produced in the thermal cracking stage, from said pyrolysis fuel oil cut boiling above 200° C., thereby producing a substantially polymeric-compounds-free cut boiling above 200° C., catalytically hydrogenating only said substantially polymeric-compounds-free cut boiling above 200° C., and recycling resultant hydrogenated polymeric-compounds-free cut boiling above 200° C. to the thermal cracking stage where said cut is mixed and thermally cracked with the unhydrogenated hydrocarbon feedstock.

4,297,205

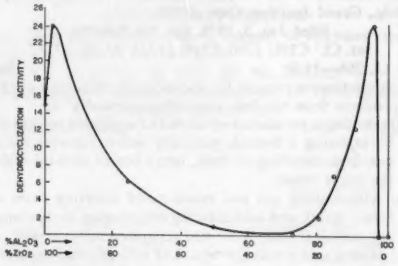
REFORMING WITH A CATALYST COMPRISING IRIDIUM, ZIRCONIA, AND ALUMINA

Rodney L. Mieville, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 946,500, Sep. 28, 1978, Pat. No. 4,240,934. This application Mar. 26, 1980, Ser. No. 134,125

Int. Cl.³ C10G *35/085*

U.S. Cl. 208—138 **10 Claims**



1. A process for the reforming of a hydrocarbon stream, which process comprises contacting said stream in a reaction zone under hydroforming conditions and in the presence of hydrogen with a catalyst comprising iridium as a hydrogenation component on a support of zirconia and alumina, said support comprising about 3 wt.% to about 15 wt.% zirconia or at least 60 wt.% zirconia.

4,297,206

SOLVENT EXTRACTION OF SYNFUEL LIQUIDS

Edward G. Scheibel, Media, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Filed Feb. 1, 1980, Ser. No. 117,591

Int. Cl.³ C10G *45/02, 67/04*

U.S. Cl. 208—254 R **14 Claims**

1. In the process of separating nonhydrocarbons from synfuel liquid by extraction using an extractor wherein a selective solvent contacts the synfuel liquid, a solvent-extract mixture is separated from a raffinate, the mixture is separated into the solvent and an extract, and the extract is returned to the extractor, the improvement which comprises hydrotreating all or a portion of the extract prior to return to the extractor, whereby nitrogen in the extract is eliminated as ammonia and the production of jet fuel is maximized.

4,297,207

PROCESS AND APPARATUS FOR THE ELECTROSTATIC DRESSING OF CARNALLITE-CONTAINING CRUDE POTASSIUM SALTS

Arno Singewald, Kassel; Irving Geisler; Günter Fricke, both of Heringen, and Rudolf Knappe, Kassel, all of Fed. Rep. of Germany, assignors to Kali and Salz AG, Kessel, Fed. Rep. of Germany

Continuation of Ser. No. 813,845, Jul. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 775,047, Mar. 7, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,521

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609048

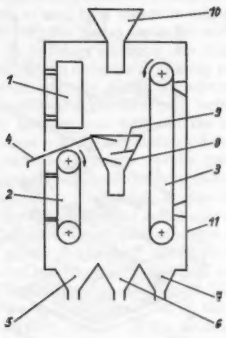
Int. Cl.³ B03B *1/00*

U.S. Cl. 209—9 **25 Claims**

1. In a process for the electrostatic dressing of a carnallite and sylvite-containing crude potassium salt, wherein the crude salt is ground, conditioned with an organic acid or a metal sulfate or sulfonate, and treated with air of 5 to 25% relative humidity prior to being subjected to an electric high voltage field, the improvement which comprises:

passing the crude salt downwardly by gravity through a vertical zone of first electric field having a voltage of about 4 kV/cm and a field length of 0.4 to 1.2 m to divide said crude salt into a carnallite fraction and a middlings fraction deficient in carnallite, and performing said passing the crude salt step in a manner wherein the initial entrance velocity of the crude salt into said first electric field is negligible relative to the average velocity imparted to the crude salt in said first field;

recovering said carnallitic fraction;



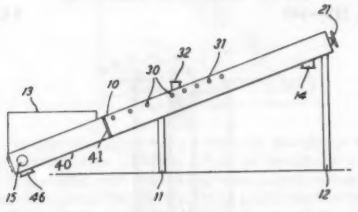
passing said middlings-fraction downwardly by gravity through a vertical zone of second electric field having a voltage of about 4 kV/cm and a field length of 1.5 to 2.5 m to divide said middlings fraction into a sylvite preconcentrate, a second middlings fraction, and a residue deficient in valuable substances, and performing said passing said middling-fraction step in a manner wherein the initial entrance velocity of said middlings-fraction into said second electric field is negligible relative to the average velocity imparted to the middlings-fraction in said second field; and recovering said sylvite preconcentrate.

4,297,208

INCLINED HELICAL FLIGHT CONVEYOR

Robert F. Christian, San Francisco, Calif., assignor to Jude Engineering, Inc., San Francisco, Calif.

Filed Nov. 14, 1980, Ser. No. 207,204
Int. Cl.³ B01D *21/06*
U.S. Cl. 210—94 **8 Claims**



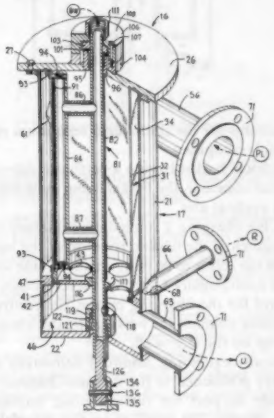
1. A helical conveyer comprising a container having an inlet for mixture at one end, an outlet for liquid at the same end, and an outlet for particulate material at the other end, a shaft rotatably mounted in the casing coaxially therewith, a helical flight fixed to the shaft between the shaft and the casing, said flight comprising a series of circular rings cut radially and pressed into helical shape, each ring being welded to the shaft at a plurality of arcs on the inner edge of the ring, said ring having openings therein between the arcs, the diameter of the shaft being 0.3 to 0.55 of the outer diameter of the ring, the radius of the openings from the centre of the ring being 1.2 to 1.6 times the radius of the shaft, said rings being unconnected with the shaft at said openings.

4,297,209

HIGH SOLIDS FILTER

Richard B. DeVisser, Schoolcraft; John W. Rishel, Vicksburg, and Joe A. Kuiper, Mattawan, all of Mich., assignors to Dover Corporation, Portage, Mich.

Filed Apr. 4, 1980, Ser. No. 137,221
Int. Cl.³ B01D *29/40*
U.S. Cl. 210—107 **24 Claims**



3. A self-cleaning filter assembly for removing solids from an incoming liquid to be filtered, of the kind including

a housing;

a cylindrical filter element within said housing;

inlet means for introducing said liquid to be filtered under pressure into said housing on one side of said filter element;

filtrate outlet means communicating with the other side of said filter element for withdrawing filtered liquid from said housing, and solids outlet means for withdrawing solids from said housing, wherein the improvement comprises:

means mounting said filter element within said housing adjacent said inlet means and with a solids collection space between said inlet means and the filtering surface of said filter element and connected with said solids outlet means;

backwash means for backwashing said filter and thereby for moving solids from the filtering surface of said filter element into said solids collection space;

said solids outlet means including a solids outlet valve adjustable between a normal operating position and an open position; and

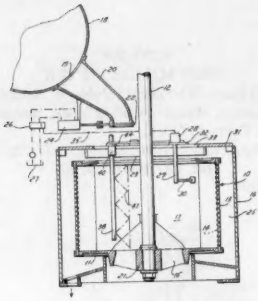
control means responsive to a preselected drop in liquid pressure at said filtrate outlet means with respect to the liquid pressure at said inlet means indicative of an excessive increase in solids concentration in said solids collection space for shifting said solids outlet valve to its open position and thereby for reducing such solids concentration by venting said solids collection space through said solids outlet valve at a high flow rate.

4,297,210

CENTRIFUGAL SEPARATOR

Claude Delfosse, Hellemes, France, assignor to Fives-Cail Babcock, Paris, France

Filed Jul. 31, 1980, Ser. No. 173,961
Int. Cl.³ B01D *33/02, 33/34*
U.S. Cl. 210—107 **5 Claims**



1. An apparatus for the centrifugal separation of solids from a liquid, which comprises

(a) a cylindrical basket having a perforate side wall defining an interior chamber, the basket being mounted for rotation about a vertical axis,

(b) means for charging a solids-liquid mixture into the interior chamber of the basket, rotation of the basket causing a cake of the solids to be built up on the side wall while the liquid is centrifugally removed therethrough,

(c) a control for the charging means, the control including

(1) a sensing element for sensing the thickness of the cake built up on the side wall,

(d) a vertically extending manifold delivering a wash fluid adjustably positioned in the interior chamber,

(e) a mobile support for the manifold, movement of the support causing the position of the manifold to be adjusted, and

(f) means movably connecting the mobile support to the control whereby the position of the manifold is a function of the thickness of the cake sensed by the sensing element of the control.

4,297,211

FILTERING APPARATUS

Edwin Hiesinger, Jenbach; Klaus Keplinger, and Hermann Nessler, both of Innsbruck, all of Austria, assignors to Inkomag, Basel, Switzerland

Continuation-in-part of Ser. No. 907,628, May 19, 1978, abandoned. This application Aug. 29, 1979, Ser. No. 70,799
Claims priority, application Austria, May 20, 1977, 3609/77
Int. Cl.³ B01D *37/02*
U.S. Cl. 210—136 **45 Claims**

1. A filtering apparatus comprising:

a housing defining a filter chamber;

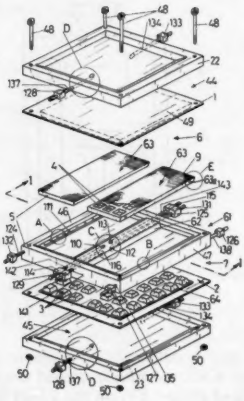
a rigid partition extending through said chamber and subdividing same into an upstream compartment and a downstream compartment communicating with said upstream compartment via throughgoing openings formed in said partition;

a support fabric overlying said partition and permeable to a fluid, said support fabric lying along a side of said partition turned toward said upstream compartment;

means including a closable inlet opening communicating with said upstream compartment and a closable outlet opening communicating with said downstream compartment for passing through said chamber from said upstream compartment to said downstream compartment a carrier medium entraining a particulate filter-aid layer onto said fabric in said upstream compartment;

means including a closable inlet opening communicating with said upstream compartment and a closable outlet opening communicating with said downstream compartment for passing a filterable medium through said chamber from said upstream compartment to said downstream compartment whereby said filterable medium traverses said layer and said fabric;

washing means including a closable inlet opening connectable with said chamber on the downstream side of said fabric and a closable outlet opening communicating with said upstream compartment at an upstream side of said fabric for passing a washing medium through said chamber from said inlet to said outlet opening and thereby backwashing said layer from said fabric and entraining material of said layer out of said chamber through said outlet opening;



means to close each of said inlet and outlet openings; and

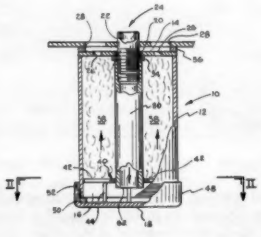
displacement means for downstream removing media residues completely from each of said compartments.

4,297,212

OIL FILTER UNIT

Henry A. Padgett, Sr., Rte. 1, Monetta, S.C. 29105

Filed Jun. 9, 1980, Ser. No. 157,875
Int. Cl.³ B01D *27/08;* F01M *1/00*
U.S. Cl. 210—168 **9 Claims**



1. An improved oil filter unit for use with an oil lubricating system of an engine having a filter-receiving fitting which includes a central, threaded oil flow pipe and oil flow passageway means radially disposed thereabout for circulating engine oil from the engine through the filter unit attached thereto; said filter unit comprising a generally cylindrical filter housing

having an end wall and an initially open opposite end for receiving a disposable filter medium therein, said end wall having a central opening therethrough for receiving the oil pipe of the engine fitting, and a plurality of openings radially disposed about said central opening for communicating with the oil flow passageway means of the engine fitting to permit circulation of oil into and out of the housing, elongate tube means in said housing extending from said end wall opening along the central axis of the housing and terminating in an open end adjacent the initially open end of the housing, a generally cylindrical disposable filter medium with central opening therethrough supportably received in said housing around and along the length of said tube means in engagement with the outer surface of the tube means and inner surface of the cylindrical wall of the housing, a closure cap threadably received on the open end of said cylindrical housing in fluid-tight relationship therewith, said tube means, filter housing, and closure cap defining an elongate oil flow path between the central opening of the housing end wall and the radially disposed openings of the end wall for circulating oil through the length of said filter medium for filtration thereby, gasket means on the outside of the housing end wall disposed radially outwardly of said end wall openings to sealingly engage the housing with the engine, filter medium support means adjacent the open end portion of said elongate tube means to supportably position the filter medium within the housing above the open end of the tube and in spaced relation from the closure cap, and means for securing the filter housing to the engine fitting flow pipe to maintain it thereon during removal of the closure cap for replacement of a filter medium in the housing.

4,297,213

APPARATUS FOR SEPARATING AND CONTACTING FRIABLE PARTICULATE ORGANIC MATTER FROM AND WITH LIQUIDS

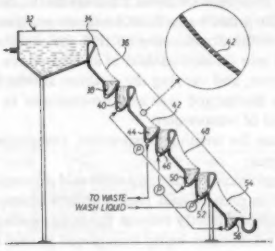
Frederick K. Airey, "Swanlands", Hilltop La., Chinnor Hill, Chinnor, Oxon, and Arthur R. Evans, Well House, Hopton, Nesscliffe, both of England

Filed Dec. 6, 1979, Ser. No. 100,988

Claims priority, application United Kingdom, Dec. 6, 1978, 47413/78

Int. Cl.³ B01D *25/04*

U.S. Cl. 210—195.1 **6 Claims**



1. An apparatus comprising a series of troughs or retention tanks positioned on different levels to operate in a cascade fashion provided with peforate screens, supply means for supplying a mixture of carrier liquid and friable particulate matter to a first trough, collecting means for receiving separated friable matter from the last perforate screen in the series; said perforate screens being concave and disposed with a generally downward slope immediately downstream of each trough to separate liquid from a mixture of liquid and friable matter overflowing from the immediately preceding trough, a trough receiving means associated with each perforate screen for receiving liquid passing through its associated perforate screen, the outlet of each perforation in each perforate screen being larger than the inlet thereof and a recycling supply means for supplying liquid to each of said troughs after the first trough, said recycling supply means being associated with each trough receiving means and connecting its associated trough receiving means with the trough next but one upstream of said associated receiving means.

4,297,214

AERATOR

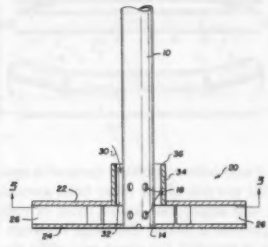
Claudio Guarnaschelli, 5583 Spruce St., Burnaby, British Columbia, Canada (V5G 1Y7)

Filed Nov. 2, 1979, Ser. No. 90,525

Claims priority, application Canada, Feb. 5, 1979, 320978

Int. Cl.³ C02F *1/74*

U.S. Cl. 210—219 **5 Claims**



1. An apparatus for mixing gases with a body of liquid having a surface, the apparatus comprising:

a hollow rotatable surface for extending downwardly from near the surface, the shaft having a top and a bottom end, said bottom end having apertures formed therethrough;

an intake for gas near the top end of the shaft for positioning above the surface;

an impeller connected to the shaft near the outlet for gas, the impeller comprising two spaced-apart discs with a plurality of vane elements therebetween;

an annular opening in a top said disc about the shaft;

a tube connected to the top disc and extending towards the top end of the shaft, above the annular opening;

a mixing zone for the gas and the liquid defined adjacent the exterior of the apertured bottom end of the shaft, the interior of the tube and a central portion of the impeller, surrounding the shaft;

an outlet for gas near the bottom end of the shaft within the mixing zone defined by said apertures formed through said shaft bottom end;

the impeller drawing liquid through the tube, through the opening past the gas outlet, for mixing the liquid with the gas in the mixing zone, and expelling the liquid outwardly from the vane elements as the impeller rotates.

4,297,215

BELT FILTER PRESS

Hans J. Altmeyer, and Josef Gebel, both of Schwalbach, Fed. Rep. of Germany, assignors to Hein, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,839

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911760

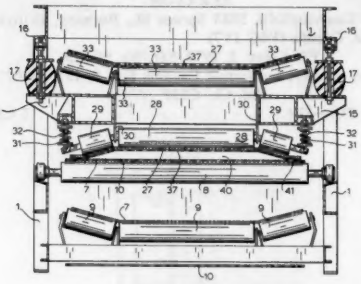
Int. Cl.³ B01D *33/02*

U.S. Cl. 210—386 **16 Claims**

1. In a belt filter press of the type having a lower and an upper endless filter belt and a lower and an upper support belt which respectively suport said lower and upper filter belts against an upper and a lower row of rollers for transport along a press path, which rows of rollers define a press slot therebetween, the improvement comprising:

means for laterally sealing said press slot including two additional rows of rollers, each additional row of rollers being disposed laterally adjacent to, and on opposite sides

of, one of said upper and lower rows of rollers for cooperative engagement with the support belt and filter belt associated with said one of said rows, said additional rows of rollers being disposed at an angle with respect to said one of said rows so that it bends and presses an edge



portion of said belts associated therewith against the associated edge portion of the other belts associated with the other of said upper and lower rows of rollers, so as to thereby prevent a lateral discharge between the edges of said belts of material fed along said press slot.

4,297,216

METHOD FOR TREATMENT OF BIOCHEMICAL WASTE

Masahiko Ishida; Ryooichi Haga, and Youji Odawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

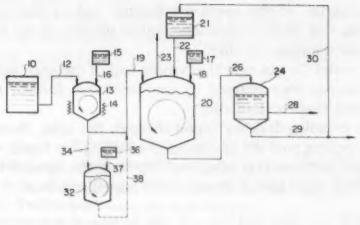
Continuation of Ser. No. 651,586, Jan. 22, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,361

Claims priority, application Japan, Jan. 22, 1975, 50/8729

The portion of the term of this patent subsequent to Jan. 10, 1997, has been disclaimed.

Int. Cl.³ C02F *11/04*

U.S. Cl. 210—613 **8 Claims**



1. A method for the treatment of a biochemical waste slurry, with the biochemical waste selected from the group of sewage sludge and garbage, comprising the steps of:

providing a slurry of the biochemical waste with a solid density greater than 3% by weight;

adding acid to the slurry to adjust its pH to a value below 3.5;

heating the slurry having its pH below 3.5 within a temperature range of 60° to 200° C. for a period of 1 to 10 minutes to reduce the viscosity of the slurry;

thereafter substantially neutralizing the acidity of the slurry to a pH of 5 to 8;

anaerobically digesting the substantially neutralized slurry at a temperature within the range of 20° to 50° C. for 20 to 40 days with mechanical agitation through the action of methane producing bacteria to convert the slurry to methane and a digested sludge; and

separating the methane from the digested sludge.

4,297,217

TREATMENT OF WASTEWATER

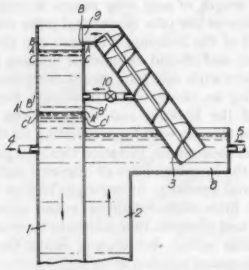
David A. Hines, Bishopton, and David H. Bolton, Linthorpe, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 12, 1980, Ser. No. 149,622

Claims priority, application United Kingdom, May 23, 1979, 17971/79

Int. Cl.³ C02F *3/22*

U.S. Cl. 210—621 **7 Claims**



1. A method for treating wastewater utilizing a downcomer-riser system, the downcomer and riser communicating directly only at their lower ends and indirectly, through a pump means, only at their upper ends, with the level of wastewater in the downcomer being maintained above the level of wastewater in the riser to provide a hydrostatic pressure head which causes circulation of the wastewater around the system at a pre-selected rate, the level of wastewater in the downcomer fluctuating between a maximum and minimum level for which self-rectification of the flow rate will occur, said method comprising the steps of:

supplying a gas containing free oxygen to the wastewater in the downcomer as it circulates down the downcomer;

effecting disengagement of gas bubbles from the wastewater prior to recirculation from the riser to the downcomer;

pumping the wastewater from an upper portion of the riser back into the downcomer so that the wastewater is discharged into the downcomer at an area above said level of wastewater, and varying the position at which the wastewater is discharged into said downcomer in response to said level of wastewater.

4. Apparatus for treating wastewater, comprising:

a downcomer;

a riser communicating directly with said downcomer only at the bottom ends of said riser and downcomer, and communicating indirectly only at the upper ends thereof;

a level of wastewater being maintained in said downcomer above the uppermost part of said riser so that a hydrostatic head is provided effecting circulation of wastewater down said downcomer and up said riser, at a pre-selected rate, and the level of wastewater in said downcomer fluctuating between maximum and minimum levels for which self-rectification of the flow rate around the system will occur;

oxygen-containing gas introducing means disposed in said downcomer for introducing oxygen-containing gas into the wastewater circulating down said downcomer;

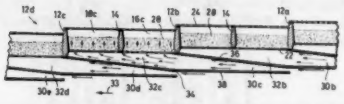
pumping means for pumping wastewater from an upper portion of said riser back into said downcomer so that the wastewater is discharged into the downcomer at an area above said level of wastewater, and means for varying the position at which the wastewater is discharged into said downcomer in response to said level of wastewater.

4,297,218

PROCESS AND APPARATUS FOR EXTRACTING A SUBSTANCE FROM A BODY OF WATER

Hans G. Bals, Blümgesgrund 44, 6460 Gelnhausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 882,447, Mar. 1, 1978, which is a continuation of Ser. No. 741,130, Nov. 11, 1976, abandoned.
This application Sep. 26, 1979, Ser. No. 79,059
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842058
Int. Cl.³ C02F 1/28
U.S. Cl. 210—661 22 Claims



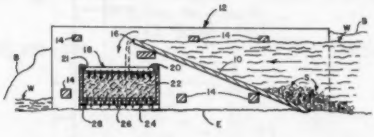
2. In a process for obtaining a dissolved, suspended or chemically bonded substance from a body of water, wherein water is taken from a substantially horizontal relative flow of said body of water and directed substantially into a vertical direction and through a fluidized bed of adsorber particles to bond said substance for extraction thereof from the water, the improvement that said water which is to be passed through the fluidized bed is passed through a diffuser means at least before being deflected into the vertical direction, thereby to increase the static pressure of said water wherein at least a low-energy boundary layer of said water, which is produced by surface friction before said flow of water reaches said diffuser means, is prevented from passing into the diffuser means by being directed therefrom by a diversion passage.

4,297,219

TEMPORARY STREAM FILTRATION SYSTEM

Joseph R. Kirk, Findlay, and Edward C. Campbell, Forest, both of Ohio, assignors to The KBI Corp., Findlay, Ohio

Filed Jan. 28, 1980, Ser. No. 115,991
Int. Cl.³ B01D 35/02
U.S. Cl. 210—669 19 Claims



1. A temporary method of purifying a contaminated and polluted water stream comprising:

(A) inserting a temporary ramp weir in the stream,

(B) forming an earth dam across said stream on each side of said ramp weir to form a dam so that all the water in said stream is caused to flow down over the weir edge of said ramp to form a falling path,

(C) positioning replaceable frames of sorbent filter material in said falling path of water from said weir whereby said ramp catches the sediment in said stream at its lower end and said filter material removes chemical contaminants and pollutants from said stream that flows over said weir edge, and

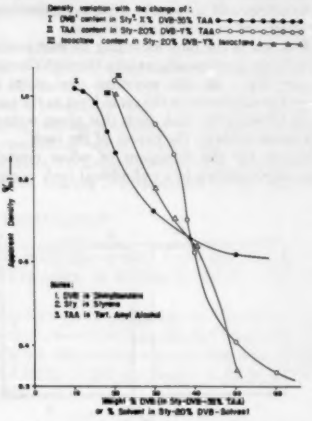
(D) removing said frame and said ramp weir from the stream after the stream water is purified.

4,297,220

MACRORETICULATED COPOLYMER ADSORPTION PROCESS

Erich F. Meitzner, Glenside, and James A. Oline, Wyncote, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 749,526, Jul. 18, 1958, Pat. No. 4,224,415.
This application May 23, 1980, Ser. No. 152,941
Int. Cl.³ C02F 1/28
U.S. Cl. 210—690 3 Claims



1. Method for adsorbing an organic material from a fluid or fluid mixture containing the same which comprises contacting the fluid or fluid mixture containing organic material with a macroreticulated crosslinked copolymer having a plurality of microscopic channels resulting from liquid explusion of a precipitating agent during polymerization of a monomer mixture under suspension polymerization conditions in an aqueous media of (1) a polyvinylidene monomer containing a plurality of ethylenically unsaturated groups in a non-conjugated relationship and (2) at least one monoethylenically unsaturated monomer, said copolymerization taking place in the pressure of a liquid which is a solvent for the monomer mixture and which does not swell the copolymer resulting from said copolymerization, said liquid being present in an amount sufficient to cause separation of the copolymer from the monomer phase, whereby the organic material is adsorbed by the macroreticulated crosslinked copolymer.

4,297,221

PROCESS AND APPARATUS FOR THE TREATMENT OF UNTREATED WATER

Hans-Georg Moll, Görzallee 49a, 1000 Berlin 45; Ulrich Hässelbarth, Adolfstrasse 3, 1000 Berlin 37; Andreas Grohmann, Drakestrasse 52a, 1000 Berlin 45, and Helmüt Marks, Maulbeerallee 34, 1000 Berlin 20, all of Fed. Rep. of Germany

Filed Sep. 12, 1979, Ser. No. 74,665
Int. Cl.³ B01D 21/01, 21/02
U.S. Cl. 210—702 6 Claims

1. An apparatus for the treatment of untreated water containing substances causing turbidity in a cylindrical tank by sedimentation using a flocculating agent added to the water causing said substance in the water to form into flakes, in which the water flows through the tank and after an adequate residence time is removed from the water surface of the tank at a rising speed which is less than the sinking speed of the flakes, said apparatus comprising:

a cylindrical tank;

one feed connection in the tank directed tangentially at the lower portion of the circumferential wall of the tank;

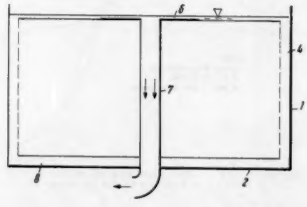
a cylindrical partition disposed in the tank, the circumferential wall of the partition forming an annular clearance with the circumferential wall of the tank;

a bottom wall of the tank and a lower end of the partition spaced apart placing the lower end of the annular clearance in free communication with the center of the tank;

the partition having perforations distributed over the circumference thereof such that the water mixed with the flocculating agent is introduced tangentially into the circumferential area of the tank and the circumferential speed of the inflowing water is reduced to such an extent by braking as it passes radially through the partition that the occurrence of upwardly directed secondary flows is prevented; and

a pipe disposed in the tank including an inlet near the top of said tank, the pipe passing axially through the tank bottom and carrying a circular overflow disc at its upper end disposed at substantially the same level as the upper end of said partition of the tank such that clean water is led off downwards through the center of the tank.

6. A process for the treatment of water containing substances causing turbidity in a cylindrical tank comprising the steps of:



(1) adding flocculent to the water in order to form said substances causing turbidity into flakes;

(2) passing the flocculent containing water tangentially into the lower periphery of the tank into an annular clearance formed by a perforated cylindrical partition and the circumferential wall of the tank, the lower end of said partition being spaced apart from the bottom wall of said tank placing the lower end of said annular clearance in free communication with the center of the tank;

(3) directing the water radially inward through said perforated cylindrical partition to reduce the circumferential speed of the inflowing water sufficiently to prevent the occurrence of upwardly directed secondary flows;

(4) maintaining the flocculent containing water in the tank for an adequate time for said flakes to form;

(5) allowing said flakes to be deposited at the bottom of said tank;

(6) drawing clean water through a centrally disposed overflow in said tank beneath the water surface in the tank, said overflow being at substantially the same level as the upper end of said partition.

4,297,222

METHOD OF PURIFYING WATER IN FISH KEEPING WATER TANK

Masanobu Takeguchi, and Isao Oyobe, both of Fujisawa, Japan, assignors to Marui Industry Co., Ltd., Tokyo, Japan

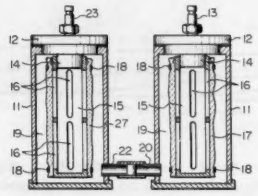
Filed Apr. 4, 1980, Ser. No. 137,269
Claims priority, application Japan, Apr. 10, 1979, 54-42474
Int. Cl.³ C02B *1/38*
U.S. Cl. 210—748 **5 Claims**

1. A method of purifying water in a fish keeping water tank comprising:

(A) circulating water at a rate such that at least half the volume of water in the tank is circulated per hour;

(B) passing the water through a UV irradiation vessel providing UV radiation having a predominant wavelength of less than 280 nm, wherein the water is exposed to at least 170 μW·min/cm^2 of UV radiation at one pass through said vessel, or a given volume of water is exposed to a total of at least 1000 μW·min/cm^2 of UV radiation during a one-hour circulation of the water;

(C) introducing the water into a first purifying tank having an inlet and an outlet and which includes a support cylinder wrapped with a first microorganism-growing bed of free-permeable nonwoven fabric made of synthetic resin and having a predetermined mesh size no smaller than 100μ, passing all of said water through said growing bed,



to thereby bring the introduced water into contact with microorganisms and to separate some of said microorganisms from said growing bed, introducing said water into a space in said first purifying tank downstream from said first microorganism growing bed, where microorganisms separated from said first growing bed are suspended and grow, to thereby bring the water into contact with such microorganisms in said space; and

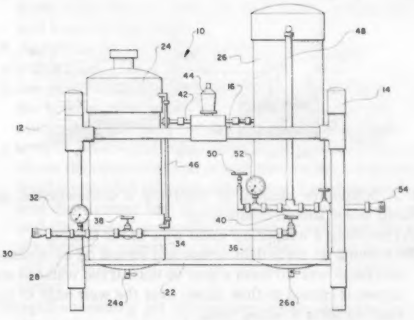
introducing the water into at least one second purifying tank located downstream from said first purifying tank, each said second purifying tank having a free-permeable synthetic resin microorganism-growing bed.

4,297,223

METHOD AND APPARATUS FOR FORMING A CHLORINE-WATER SOLUTION AND FOR UTILIZING THE SAME TO DISINFECT WATER LINES AND THE LIKE

Morrison Rivenbark, Kinston, N.C., assignor to Douglas R. Smith, Kinston, N.C.

Filed Jul. 28, 1980, Ser. No. 172,679
Int. Cl.³ C02B *3/06*
U.S. Cl. 210—754 **9 Claims**



1. A chlorinator design for such use as sterilizing water lines and the like comprising: a chlorine tank having chlorine therein and adapted to receive water therein and to form a concentrated chlorine water solution; mixing tank means for receiving both water and the concentrated chlorine-water solution from said chlorine tank and mixing the two together to form a mixed chlorine solution; line means communicatively

connected between said chlorine tank and said mixing tank for transferring the concentrated chlorine-water solution from said chlorine tank to said mixing tank; inlet water line means operatively connected to both said chlorine tank and said mixing tank for simultaneously directing water to both said chlorine tank and said mixing tank wherein the circulation of water through said chlorine tank forms the concentrated chlorine-water solution and wherein the water directed to said mixing tank acts to combine with said concentrated chlorine-water solution to form a final mixed chlorine solution; valve means operatively associated with said chlorine tank for adjusting the flow of water directed through said chlorine tank from said inlet water line means; and outlet line means communicatively connected to said mixing tank and extending therefrom for directing the mixed chlorine solution from said mixing tank, whereby the formed chlorine solution can be directed through water lines or the like for sterilizing the same.

4,297,224
METHOD FOR THE CONTROL OF BIOFOULING IN RECIRCULATING WATER SYSTEMS

Nick T. Macchiarolo; Billy G. McGuire, and John M. Scalise, all of El Dorado, Ark., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Jun. 4, 1980, Ser. No. 156,508
Int. Cl.[3] C02F *1/76, 1/50*
U.S. Cl. 210—755 **6 Claims**

1. A method of controlling biofouling in recirculating water systems for heat exchange systems without disinfecting the bulk recirculating water comprising the steps of:

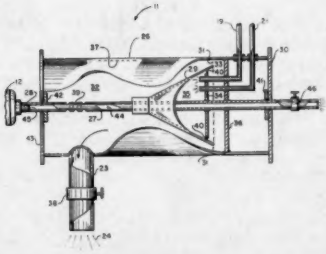
introducing a biocidally effective amount of 1-bromo-3-chloro-5,5-dimethylhydantoin into the water in order to kill biofouling microorganisms at film-forming surfaces of the system; and

thereafter maintaining the concentration of 1-bromo-3-chloro-5,5-dimethylhydantoin at a level effective to inhibit regrowth of such microorganisms at such surfaces without maintaining a continuous measurable halogen residual in the recirculating water and without disinfecting the bulk recirculating water.

4,297,225
RECYCLING CENTRIFUGE FOR THE REDUCTION OF VISCOSITY AND GEL STRENGTH OF DRILLING FLUIDS

Bobby G. Hartley, 1011 Iberville St., Donaldsonville, La. 70346

Continuation-in-part of Ser. No. 838,388, Sep. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 755,973, Dec. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,078, Oct. 14, 1975, abandoned. This application Aug. 10, 1978, Ser. No. 932,536
Int. Cl.[3] B04B *5/00*
U.S. Cl. 210—779 **8 Claims**



1. A process for reducing the viscosity and gel strength of a hydratable clay containing drilling mud which comprises contacting said mud with the inner surface of a revolving cone, the total included angle of the cone ranging from about 40° to about 120°, the cone revolving at a speed ranging from about 400 to about 6000 revolutions per minute, sufficient to impart adequate compression force to dewater the hydrated clay constituent and thereby reduce the viscosity and gel strength of said mud.

4,297,226
PROCESS FOR SECONDARY RECOVERY

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 917,056, Jun. 19, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,141
Int. Cl.[3] E21B *43/22*
U.S. Cl. 252—8.55 D **17 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of an N-substituted polyacrylamide bearing N-substituents of the formula:

$$-(CH_2CH_2O)_mSO_3M$$

wherein m is an integer of from 1 to 5 and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well, and wherein the number average molecular weight of the said N-substituted polyacrylamide is about 10,000 to about 2,000,000.

4,297,227
METHOD FOR CONTINUOUS GREASE MANUFACTURE

Arnold C. Witte, Port Neches, and Richard L. Coleman, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 16,597, Mar. 2, 1979, abandoned. This application Jan. 18, 1980, Ser. No. 113,162
Int. Cl.[3] C10M *5/16, 5/14, 5/02, 7/22*
U.S. Cl. 252—18 **8 Claims**

1. In a continuous grease manufacturing process wherein a saponifiable material is reacted with an aqueous solution of a metal base in a saponification zone at saponification conditions of elevated temperature and superatmospheric pressure to produce a soap containing saponification reaction product, wherein said saponification reaction product is passed through a pressure reducing means to effect pressure reduction and to flash vaporize substantially all the water present in said saponification reaction product and the said flashed vaporized water as well as any remaining water is removed from said saponification reaction product by flash vaporization in a dehydration zone to produce a dehydrated saponification product, and wherein said dehydrated saponification product in said dehydration zone is recycled through a shear valve for conditioning said soap contained therein, and wherein lubricating oil is added to said recycled dehydrated saponification product for producing a grease product; the improvement which comprises:

(a) admixing an aqueous solution of at least one water soluble additive compound, which improves properties of said grease product, with said saponification reaction product under conditions of superatmospheric pressure sufficient to maintain water present in the liquid phase and at an elevated temperature sufficiently high for flash vaporizing substantially all water present in the resulting admixture upon subsequent substantial pressure reduction, thereby forming a hot combined mixture of saponification reaction product and aqueous additive solution; and

(b) passing said formed hot combined mixture through a

pressure reducing means that is maintained at a pressure not greater than about atmospheric and sufficient for flash vaporizing substantially all water present in said hot formed mixture and passing the resulting substantially dehydrated mixture and vaporized water into said dehydration zone to flash vaporize any remaining water in said mixture and for producing additive particles of a size not greater than about 10 microns distributed within said dehydrated mixture.

4,297,228

DECORATED SOAP AND METHOD FOR PRODUCING THE SAME

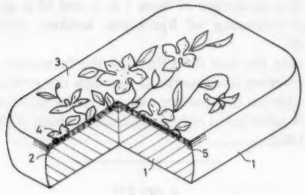
Masataka Kamada, 94-4071banchi, Haishima-cho, Akishima-city, Tokyo, and Seiji Satoh, 6-140banchi, Segasaki, Urawa-city, Saitama-district, both of Japan

Filed Jul. 14, 1980, Ser. No. 168,674

Claims priority, application Japan, Apr. 19, 1980, 55-51119

Int. Cl.³ B44C *1/16;* **C11D** *17/00, 17/04*

U.S. Cl. 252—92 **4 Claims**



1. Decorated soap which comprises, in combination, a cake of soap, a synthetic resin layer formed on one side surface of said soap, said synthetic resin layer being formed by applying a composition of 30% acrylic resin, 15% nitrocellulose and 55% solvents, a release layer having a printed layer representing a pattern consisting of designs and/or characters, said release layer being formed by applying a composition of 15 to 25% cellulose ester plus plasticizer and 75 to 85% solvents, and an adhesive layer which joins said synthetic resin layer with said release layer, said adhesive layer being formed by applying a composition of 23 to 50% adhesive base materials and 50 to 77% solvents.

3. A method for producing decorated soap which comprises the steps of:

a. forming a synthetic resin layer on one side surface of soap to be treated by applying a composition of 30% acrylic resin, 15% nitrocellulose and 55% solvents;

b. forming a release layer on a backing film by applying a composition of 15 to 25% cellulose ester plus plasticizer and 75 to 85% solvents, reversely printing a desired pattern on said release layer, and forming an adhesive layer on said printed release layer by applying a composition of 23 to 50% adhesive base materials and 50 to 77% solvents, thereby forming a transfer sheet;

c. bringing said adhesive layer of transfer sheet into contact with said synthetic resin layer on said soap by moving said transfer sheet in front of a rotary rubber roller which is heated at a temperature between about 180° C. and about 250° C., with said synthetic resin layer on said soap being opposed to said adhesive layer of said transfer sheet, and then pressing said soap together with said transfer sheet to said rotary rubber roller under a pressure between about 200 g/cm^2 and 1000 g/cm^2; and

d. peeling only said backing film of transfer sheet from said joined product.

4,297,229

PARTICULATE BORATE-SOAP COMPOSITIONS

Richard C. Speak, and Donald J. Ferm, both of Fullerton, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Oct. 23, 1979, Ser. No. 87,377

Int. Cl.³ C11D *9/16, 11/00, 17/06*

U.S. Cl. 252—109 **20 Claims**

1. The method of producing a particulate borate soap composition comprising heating C_8–C_{18} fatty acid at a temperature of from about 40° to 100° C. at which temperature said fatty acid is a liquid and intimately mixing said liquid fatty acid with a mixture of finely divided alkali metal carbonate and hydrated sodium tetraborate to form the alkali metal salt of said fatty acid and thereby produce a particulate hydrated sodium tetraborate-soap-alkali metal bicarbonate composition containing about 25 to 50% as anhydrous sodium tetraborate, wherein the mole ratio of said fatty acid to alkali metal carbonate is in the range of from 1:1 to about 1:2, said finely divided alkali metal carbonate is substantially of a particle size smaller than 100 mesh, and the soap content of the resultant particulate product is in the range of about 5 to 35% by weight.

4,297,230

NON-CRYSTALLIZING TRANSPARENT SOAP BARS

Jacobus C. Rasser, Grimbergen, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 31, 1980, Ser. No. 117,320

Claims priority, application United Kingdom, Feb. 6, 1979, 04197/79; Nov. 1, 1979, 37809/79

Int. Cl.³ C11D *9/30, 3/10*

U.S. Cl. 252—117 **10 Claims**

1. A transparent soap bar, consisting essentially of from about 4% to about 20% potassium soap, the balance of the soap component of said soap bar comprising sodium, ammonium or alkanolamine soap, at least about 0.2% chloride anions, from about 4% to about 25% moisture and from about 0.2% to about 5% of an electrolyte selected from the group consisting of potassium carbonate, sodium formate, potassium formate, sodium tartrate, potassium tartrate, sodium citrate, potassium citrate, sodium acetate, potassium acetate, potassium ammonium tartrate, ammonium acetate, ammonium carbonate, ammonium formate, ammonium citrate, ammonium lactate, ammonium bisulfate, and mixtures thereof.

4,297,231

PROCESS FOR PRODUCING A POSITIVE ELECTRODE FOR A NON-AQUEOUS ELECTROLYTIC CELL

Toshiki Kahara; Kohki Tamura; Noboru Ebata; Fumio Sato, and Tomio Yoshida, all of Ibaraki, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,926

Claims priority, application Japan, Jan. 6, 1979, 54-865

Int. Cl.³ H01M *4/50, 4/04*

U.S. Cl. 252—182.1 **9 Claims**

1. A process for producing a positive electrode for a non-aqueous electrolytic cell comprising the steps of:

(a) heat-treating manganese dioxide;

(b) adding the thus heat-treated manganese dioxide with a conducting agent and a binder to be mixed together;

(c) heat-treating the resultant mixture; and

(d) molding the thus heat-treated mixture to form a positive electrode.

4,297,232

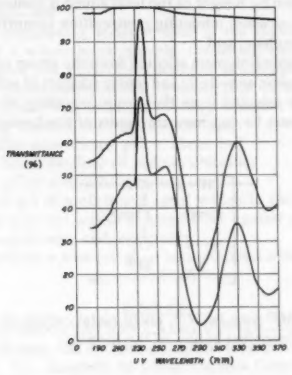
GLYCOL-IODINE COMPOSITION AND METHOD OF PREPARATION

Samuel Ruben, 271 North Ave., New Rochelle, N.Y. 10801

Continuation-in-part of Ser. No. 868,769, Jan. 12, 1978, abandoned, which is a continuation of Ser. No. 714,760, Aug. 16, 1976, abandoned. This application Jan. 25, 1979, Ser. No. 6,946

Int. Cl.[3] A61K *33/18;* A01N *59/12*

U.S. Cl. 252—187 R 29 Claims



1. A composition consisting essentially of a glycol component selected from the group consisting of ethylene glycol, the polymers thereof and mixtures thereof, and iodine, said iodine present in an amount up to the saturation point of said iodine in said glycol component,

said composition characterized by the absence of a spectroscopically identifiable complex between said glycol component and said iodine, and the absence of free iodine therein.

4,297,233

DEODORIZING COMPOSITION FOR ASH TRAYS

Paolo Gualandi, 16/A, Via Rosario, Bologna, Italy

Filed May 14, 1979, Ser. No. 38,751

Claims priority, application Italy, Jun. 27, 1978, 12684 A/78

Int. Cl.[3] C09K *3/00;* A61K *7/46;* C11B *9/00*

U.S. Cl. 252—259.5 8 Claims

1. A deodorizing composition comprising, in combination;

(a) A solid absorbent granular material, of a grain size in the range of 20 to 65 mesh per cm^2, composed in weight % of:

SiO_2: from 90 to 95%,

Al_2O_3: from 4 to 7%,

Fe_2O_3: from 1 to 2%,

CaO: from 0 to 0.5%,

MgO: from 0 to 0.5%,

the remainder comprising water and traces of alkalies or other metallic oxides;

(b) An oily essence absorbed in said absorbent material, the ratio of oily essence to absorbent material being, in parts by weight, in the range of 1:1.5 to 1:1; and

(c) A vapor diffusion fixation agent selected from the class consisting of silicone oils, higher alcohols, plastifiers, and mixtures thereof.

4,297,234

BENZOXAZOLYL-STILBENES

Kurt Burdeska, Basel, and Guglielmo Kabas, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

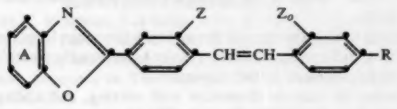
Filed May 5, 1980, Ser. No. 146,960

Claims priority, application Switzerland, May 17, 1979, 4596/79

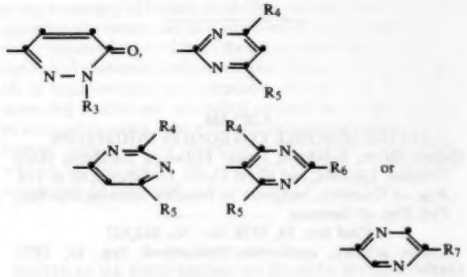
Int. Cl.[3] C07D *413/10, 413/14*

U.S. Cl. 252—301.24 14 Claims

1. A benzoxazolyl-stilbene of the formula



in which R is one of the ring systems of the formulae



in which R_3 is hydrogen, alkyl having 1 to 4 C atoms, unsubstituted phenyl or phenyl substituted by chlorine or methyl, R_4 and R_5 independently of one another are hydrogen, alkyl having 1 to 4 C atoms, unsubstituted phenyl or phenyl substituted by chlorine or methyl, alkoxy having 1 to 4 C atoms, alkoxyalkoxy having a total of 3 to 8 C atoms, unsubstituted phenoxy or phenoxy substituted by chlorine or methyl, chlorine, alkylthio having 1 to 4 C atoms, phenylthio, alkylamino having 1 to 4 C atoms, dialkylamino having a total of 2 to 8 C atoms, morpholino, piperidino, piperazino, pyrrolidino or anilino, R_6 is alkyl having 1 to 4 C atoms, unsubstituted phenyl or phenyl substituted by chlorine or methyl and R_7 is alkoxy having 1 to 4 C atoms, alkoxyalkoxy having a total of 2 to 8 C atoms, alkylthio having 1 to 4 C atoms, unsubstituted phenoxy or phenoxy substituted by chlorine or methyl, cycloalkyloxy, alkylthio having 1 to 4 C atoms, unsubstituted phenylthio or phenylthio substituted by chlorine or methyl, alkylamino having 1 to 4 C atoms, dialkylamino having a total of 2 to 8 C atoms, morpholino, piperidino, piperazino, pyrrolidino or anilino, one of Z and Z_o is hydrogen and the other is hydrogen or chlorine and the benzene nucleus A is unsubstituted or substituted by non-chromophoric substituents selected from alkyl, halogenalkyl, cyanoalkyl, hydroxyalkyl, alkoxyalkyl, phenoxyalkyl, carboxyalkyl, salts, esters and amides of carboxylalkyl, aralkyl, cycloalkyl, alkenyl, alkoxy, hydroxyalkoxy, alkoxyalkoxy, aralkoxy, phenoxyalkoxy, cyanoalkoxy, alkenyloxy, carboxy, sulfo, carboxylic and sulfonic acid salts, esters and amides, alkylsulfonyl, phenylsulfonyl, aryl, aryloxy and two adjacent radicals forming together the remaining members of an aromatic carbocyclic ring system.

4,297,235
METHOD OF PREPARING A MICROCAPSULE DISPERSION

Yoshiyuki Hoshi; Takayuki Hayashi, and Fujio Kakimi, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 5, 1979, Ser. No. 91,309
Claims priority, application Japan, Nov. 7, 1978, 53-136964
Int. Cl.³ B01J *13/02*
U.S. Cl. 252—316 **9 Claims**

1. In a method of preparing a dispersion of microcapsules whose walls comprise formaldehyde as one of the wall components, the improvement which comprises

preparing a dispersion containing microcapsules with microcapsule walls of an amino-formaldehyde condensation resin,

adding urea to the capsule dispersion in the range from about 1/10 to 5 times greater on a molar basis than the formaldehyde contained in the dispersion,

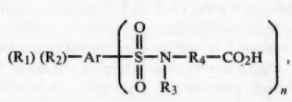
heating the capsule dispersion with stirring, and adding a solution of sulfite, hydrogensulfite or a mixture thereof to the capsule dispersion in the range from about 0.02 to 1 mol per mol of formaldehyde.

4,297,236
WATER MISCIBLE CORROSION INHIBITORS

Helmut Diery, Kelkheim; Rainer Helwerth, Eschborn; Horst Fröhlich, Eppstein, and Horst Lorke, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,337
Claims priority, application Switzerland, Sep. 19, 1977, 11419/77
Int. Cl.³ C23F *11/14, 11/16, 11/18*
U.S. Cl. 252—389 R **3 Claims**

1. Corrosion inhibitors consisting essentially of a mixture of (A) reaction products of boric acid and diethanolamine, and (B) arylsulfonamidocarboxylic acids of the formula I



I

in which

R_1 and R_2 each represent hydrogen, fluorine, chlorine, bromine, an alkyl or alkoxy radical having from 1 to 4 carbon atoms, with the proviso that the sum of the carbon atoms of R_1 and R_2 does not exceed 7;

Ar is a benzene, naphthalene or anthracene radical;

R_3 is hydrogen, an aryl radical having up to 4 carbon atoms, a β-cyanoethyl or hydroxyalkyl radical having from 2 to 4 carbon atoms;

R_4 is an alkylene radical having more than 3 carbon atoms, optionally substituted by one or more methyl or ethyl radicals; and

n is 1 or 2; or

alkyl- and/or cycloalkylsulfonamidocarboxylic acids obtained by sulfochlorination of a saturated aliphatic and/or cycloaliphatic hydrocarbon having from 12 to 22 carbon atoms and a boiling temperature range of from about 200° to 350° C., subsequent reaction with ammonia and final condensation with chloroacetic acid.

4,297,237
POLYPHOSPHATE AND POLYMALEIC ANHYDRIDE COMBINATION FOR TREATING CORROSION

Bennett P. Boffardi, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

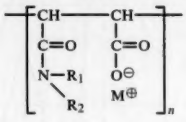
Filed Mar. 6, 1980, Ser. No. 127,675
Int. Cl.³ C23F *11/18, 11/14, 11/16*
U.S. Cl. 252—389 A **11 Claims**

1. A method of inhibiting corrosion in an aqueous system comprising the step of treating said system with from 1.0 to 300 parts per million by weight of the total aqueous content of said system, of a corrosion inhibiting composition comprising

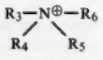
(1) polyphosphate; and

(2) one or more polymers selected from the group consisting of polymaleic anhydride and amine adducts of polymaleic anhydride selected from the group consisting of:

(a) polymers having recurring units of the formula:



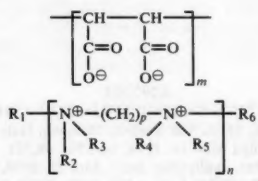
wherein $M^{\oplus}$ may be $H^{\oplus}$, alkali metal cation, or quaternary ammonium cation of the formula:



wherein for all of the above formulas, R_1, R_2, R_3, R_4, R_5, and R_6 are each independently selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, and substituted alkyl of from one to ten carbon atoms, where the substituent is hydroxyl; carbonyl; and carboxylic acid groups, and alkali metal ion and ammonium salts thereof; and

wherein n is an integer of from 2 to 100; and

(b) polymers having recurring units of the formula:



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are each independently selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, and substituted alkyl of from one to ten carbon atoms, where the substituent is hydroxyl; carbonyl; and carboxylic acid groups, and alkali metal ion and ammonium salts thereof;

wherein p is an integer of from 1 to 6;

wherein m is an integer of from 2 to 100; and

wherein n is an integer of from 2 to about 100, provided that, n not equal to m, the lesser of m or n is multiplied by a factor such that n=m;

wherein the polymaleic anhydride and amine adducts of polymaleic anhydride have a weight average molecular weight of from about 200 to about 10,000; and

wherein the weight ratio of polyphosphate to polymer is from 10:1 to 1:10.

4,297,238

HEMOLYSING SOLUTION PREPARING HEMOLYSED BLOOD HAVING A STABILIZED GLUCOSE CONTENT

Rolf Vormbrock, and Roland Helger, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,347

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850603

Int. Cl.[3] G01N *33/48;* C09K *3/00*

U.S. Cl. 252—408 7 Claims

1. In a hemolysing solution used in the determination of glucose in a whole blood sample, consisting essentially of a lysing reagent and a glycolysis inhibitor which inhibits glycolysis in the hemolysate obtained by contacting the blood sample with the hemolysing solution, the improvement wherein the hemolysing solution consists essentially of

(a) a buffer providing a pH of about 6–8;

(b) 0.8–3.0 moles/liter of sodium chloride;

(c) 1–4 g/l of a surface active agent;

(d) 0.5–2 g/l of a chelating agent which in the presence of component (c) serves as a stabilizer against glycolysis in the hemolysate; and, optionally,

(e) an effective amount of an antimicrobial agent.

4,297,239

HYDROFORMYLATION CATALYST REACTIVATION

David R. Bryant, and Richard A. Galley, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 58,123, Jul. 16, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 120,101

Int. Cl.[3] B01J *31/40, 31/24;* C07C *45/50;* B01J *31/20*

U.S. Cl. 252—412 54 Claims

1. A process for preparing a hydroformylation medium, said medium comprising a rhodium complex and triarylphosphine, which comprises mixing a rhodium complex concentrate with a sufficient amount of triarylphosphine so that there is at least about 10 moles of free triarylphosphine per mole of rhodium present in said medium; said rhodium complex concentrate having been produced by a process which comprises concentrating a spent hydroformylation reaction medium that contains a partially deactivated rhodium complex catalyst, free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products, into at least two separate material streams so as to remove free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products from said spent hydroformylation reaction medium by means of distillation at temperatures of about 20° C. to about 350° C. and at pressures of about 1000 mm Hg. to about 1×10^{-6} mm Hg., wherein one stream is said rhodium complex concentrate distillation residue containing a major amount of the rhodium of said catalyst and which has been concentrated to about 0.1 to about 30 percent by weight of said spent hydroformylation reaction medium, and the other material stream or streams consist essentially of one or more of the distilled volatile components of said spent hydroformylation reaction medium.

28. A hydroformylation medium comprising a rhodium complex and at least about 10 moles of free triarylphosphine per mole of rhodium present in said medium, said rhodium complex having been derived from a rhodium complex concentrate which has been produced by a process which comprises concentrating a spent hydroformylation reaction medium that contains a partially deactivated rhodium complex catalyst, free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products, into at least two separate material streams so as to remove free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products from said spent hydroformylation reaction medium by means of distillation at temperatures of about 20° C. to about 350° C. and at pressures of about 1000 mm Hg. to about 1×10^{-6} mm Hg., wherein one stream is said rhodium complex concentrate distillation residue containing a major amount of the rhodium of said catalyst and which has been concentrated to about 0.1 to about 30 percent by weight of said spent hydroformylation reaction medium, and the other material stream or streams consist essentially of one or more of the distilled volatile components of said spent hydroformylation reaction medium.

31. A hydroformylation medium as defined in claim 28, wherein the distillation takes place in two stages and wherein the second distillation stage is distilled at a lower pressure than the first distillation stage.

4,297,240

SOLUTION POLYMERIZATION

Robert E. Bingham, Cuyahoga Falls; Richard R. Durst, Stow; Hubert J. Fabris, Akron; Ivan G. Hargis, Tallmadge; Russell A. Livigni, and Sundar L. Aggarwal, both of Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 124,373, Feb. 25, 1980. This application Aug. 15, 1980, Ser. No. 178,248

Int. Cl.[3] C08F *4/10*

U.S. Cl. 252—431 R 8 Claims

1. A composition of matter useful as an anionic polymerization catalyst comprising (1) an alcoholate selected from the group consisting of barium alcoholate, calcium alcoholate and strontium alcoholate and mixtures thereof, (2) an organoaluminum compound selected from the group consisting of alkyl and cycloalkyl aluminum compounds and mixtures of the same and (3) an organomagnesium compound selected from the group consisting of alkyl and cycloalkyl magnesium compounds and mixtures of the same, where the mol ratio computed as metal of barium, calcium and/or strontium to magnesium is from about 1:10 to 1:2 and where the mol ratio computed as metal of magnesium to aluminum is from about 105:1 to 1.5:1.

4,297,241

METHOD OF PREPARING AN OLEFIN HYDRATION CATALYST

Percy R. Kavasmaneck; David B. Stanton, and Paul D. Sherman, Jr., all of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,496

Int. Cl.[3] B01J *21/08, 21/12, 27/16*

U.S. Cl. 252—435 2 Claims

1. Method of preparing an olefin hydration catalyst which comprises the steps of:

(1) blending a mixture of about 30 to about 70 parts by weight of diatomaceous earth, about 15 to about 30 parts by weight of bentonite, about 15 to about 30 parts by weight of a synthetic silica having a surface area of about 150 to about 200 meters^2 per gram, about 5 to about 25 parts by weight of cornmeal and about 5 to about 25 parts by weight of cellulose with sufficient water to form a paste;

(2) extruding the paste from step 1 into pellets;

(3) drying said pellets;

(4) calcining said dried pellets at a temperature of about 650° to about 730° C.;

(5) leaching the calcined pellets with aqueous 85 percent phosphoric acid until metallic impurities are reduced to a minimum;

(6) washing the leached pellets with water until the wash water is approximately neutral;

(7) drying the pellets;

(8) impregnating the dried pellets with 65 percent phosphoric acid at room temperature;

(9) draining off excess phosphoric acid; and

(10) drying the pellets at a temperature of about 100° to about 400° C.

4,297,242

PROCESS FOR DEMETALLATION AND DESULFURIZATION OF HEAVY HYDROCARBONS

Albert L. Hensley, Jr., Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana)

Division of Ser. No. 928,141, Jul. 26, 1978, Pat. No. 4,212,729. This application Jul. 14, 1980, Ser. No. 168,297

Int. Cl.[3] B01J *27/02, 23/16*

U.S. Cl. 252—439 15 Claims

1. A hydrodesulfurization catalyst consisting essentially of at least one active original hydrogenation metal selected from Group VIB deposed on a catalytically active support comprising alumina, said Group VIB metal being in at least one form selected from the group consisting of the elemental form, the oxide, and the sulfide, said catalyst having a surface area within the range of about 150 m^2/gm to about 300 m^2/gm, having a majority of its pore volume in pore diameters within the range of about 80 Å to about 130 Å, and a pore volume within the range of about 0.4 cc/gm to about 0.9 cc/gm.

4,297,243

MOLYBDENUM-EXCHANGED CRYSTALLINE ALUMINOSILICATE ZEOLITE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 2, 1979, Ser. No. 81,105

Int. Cl.[3] B01J *29/16, 29/26, 29/36*

U.S. Cl. 252—455 Z 26 Claims

1. A crystalline aluminosilicate zeolite having a composition expressed in molar ratios of oxides as:

$$\left(cM_{\frac{2}{n}}O + bMoO_3\right) : Al_2O_3 : xSiO_2 : yH_2O$$

where $cM_{2/n}O$ represents the sum of all components, on a per mole of Al_2O_3 in the crystal framework basis, required to balance that portion of the charge on the crystal framework not balanced by molybdenum constituents, with the valence of M being represented by n, and where MoO_3 represents all molybdenum constituents balancing a charge on the crystal framework, and c, b, x, and y represent the moles of $M_{2/n}O$, MoO_3, SiO_2, and the water of hydration, H_2O, respectively, present in the zeolite to each mole of Al_2O_3 in the crystal framework, x being between 2 and 100, y being a non-negative number, c being 0 or a positive number less than 1, and b being a positive number no greater than 1, with c+b being a positive number no greater than 1.0, said zeolite being characterized by the ion exchange of molybdenum-containing cations from the zeolite when the zeolite is immersed for at least one hour in an aqueous sodium salt solution having a temperature in the range of 20° to 80° C. and an initial pH between 6.0 and 8.5, said solution containing sodium ions in a concentration between 1.0 and 15.0% by weight, calculated as Na, and said immersion being such that the weight ratio of zeolite to solution is between about 1:4 and 1:12.

14. A catalyst composition comprising a molybdenum-containing crystalline aluminosilicate zeolite having an ordered crystalline structure prepared by the method comprising (1) contacting a crystalline aluminosilicate zeolite having a substantially ordered crystalline structure with an aqueous solution containing a precursor of $MoO_2{}^{+2}$ cations, said solution having sufficient of an organic base added thereto to maintain the pH of the solution below 7.0 but higher than that which would substantially affect the crystalline structure of the zeolite, said contacting being under conditions sufficient to replace at least some of the cations in the zeolite with molybdenum-containing cations and increase the molybdenum-containing cation content of the zeolite, and (2) subsequently calcining the zeolite containing the molybdenum-containing cations in an oxygen-containing oxidizing atmosphere.

21. A method for ion-exchanging molybdenum-containing cations into a crystalline aluminosilicate zeolite having an ordered crystalline structure comprising contacting a crystalline aluminosilicate zeolite having an ordered crystalline structure with an aqueous solution containing a precursor of $MoO_2{}^{+2}$ cations, said solution having sufficient of an organic base added thereto to maintain the pH of the solution during said contacting below 7.0 but higher than that which would substantially affect the crystal structure of the zeolite, said contacting being under conditions sufficient to replace at least some of the cations in said zeolite with molybdenum-containing cations, and recovering the zeolite containing the molybdenum-containing cations from said solution.

4,297,244

CATALYST AND PROCESS FOR CONVERSION OF HYDROCARBONS

John Mooi, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 846,046, Oct. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,657, Apr. 29, 1976, Pat. No. 4,252,632. This application Apr. 21, 1980, Ser. No. 142,484

Int. Cl.[3] B01J *29/06, 23/56*

U.S. Cl. 252—455 Z 34 Claims

1. Combined particles comprising (A) a major amount of solid particles capable of promoting the cracking of hydrocarbon feedstock at hydrocarbon cracking conditions to produce at least one hydrocarbon product and to cause deactivating carbonaceous material to be formed on said combined particles and (B) a minor amount of discrete entities comprising (1) a major amount by weight of substantially accessible alumina, (2) a minor, catalytically effective amount of at least one platinum group metal component deposited on said alumina, said platinum group metal component deposited on said alumina, said platinum group metal component being capable of promoting the oxidation of carbon monoxide to carbon dioxide at carbon monoxide oxidation conditions, and (3) minor, catalytically effective amount of at least one crystalline aluminosilicate zeolite capable of promoting hydrocarbon cracking at the conditions in said reaction zone.

8. A composition of matter suitable for use in a chemical reaction zone-regeneration zone system comprising in intimate admixture (A) a major amount of solid particles capable of promoting the cracking of sulfur-containing hydrocarbon feedstock at hydrocarbon cracking conditions to produce at least one hydrocarbon product and to cause sulfur-containing carbonaceous material to be formed on said solid particles and (B) a minor amount of discrete entities comprising a major amount of alumina capable of associating with sulfur trioxide at the conditions in said regeneration zone and disassociating with sulfur trioxide at the conditions of said reaction zone and a minor, catalytically effective amount of at least one crystalline aluminosilicate zeolite capable of promoting hydrocarbon cracking.

4,297,245

CATALYST FOR THE PREPARATION OF METHANE

Burton H. Bartley, Fishkill, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 636,237, Nov. 28, 1975, Pat. No. 4,065,514, which is a continuation-in-part of Ser. No. 272,528, Jul. 17, 1972, abandoned. This application Nov. 21, 1977, Ser. No. 853,079

Int. Cl.[3] B01J *21/08, 23/56, 23/74*

U.S. Cl. 252—460 7 Claims

1. A finely-divided, high surface area supported catalyst, particularly characterized by its ability to catalyze the production of methane by the reaction of hydrogen and a hydrocarbon containing at least two carbon atoms at a temperature of 300° C.-800° C. which consists essentially of a support, a metal of the platinum-palladium group and a metal of the iron group, each of said platinum-palladium group metal and said iron

group metal being substantially distributed throughout the body of the catalyst.

4,297,246

METHOD OF PRODUCING DENSE REFRACTORY OXIDE COATINGS ON METALLIC SUBSTRATES AND THE PRODUCTION OF CATALYSTS FROM THE COATED SUBSTRATES

James A. Cairns, Wantage; Robert L. Nelson, Kingston Bagpuize, and James L. Woodhead, Didcot, all of England, assignors to United Kingdom Atomic Energy Authority, England

Filed Oct. 25, 1978, Ser. No. 954,532

Claims priority, application United Kingdom, Nov. 1, 1977, 45471/77

Int. Cl.[3] B01J *21/08, 23/10, 23/56;* B32B *15/18*

U.S. Cl. 252—465 10 Claims

1. A method of coating a substrate with a refractory oxide selected from the group consisting of ceria, zirconia and titania which comprises the steps of

(i) contacting the substrate with a sol of said refractory oxide comprising a dispersion, in a liquid medium, of substantially unaggregated colloidal primary particles of the refractory oxide or of aggregated colloidal primary particles of the refractory oxide and ions which occupy gaps in said aggregated particles, said sol being capable of being converted to a gel of the refractory oxide, the bulk density of the gel being at least 40% of the theoretical density of the refractory material;

(ii) converting the sol to a gel to provide the substrate with a gel coating; and

(iii) firing to convert the gel coating to said refractory oxide coating.

3. A method according to claim 1 wherein catalytically active material is applied to the coated substrate.

4,297,247

PREPARATION OF COATED CATALYSTS

Richard Krabetz, Kirchheim; Walter Herrmann, Mannheim; Heinz Engelbach, Limburgerhof; Peter Palm, Gerolsheim; Karl Sommer, Ludwigshafen, and Heinrich Spahn, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,385

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909671

Int. Cl.[3] B01J *23/22, 23/28, 23/30, 23/72*

U.S. Cl. 252—468 6 Claims

1. In a process for the preparation of a coated catalyst comprising

(a) an inert carrier having a particle diameter of not less than 100 μm and a surface area of up to 20 m^2/g and

(b) a coating which firmly adheres to the outer surface and in the edge zone, near the surface, of the carrier particles, and which contains the catalytic material, by applying the catalytic material, in the form of a powder of particle size not more than 300 μm, in the presence of water, to the vigorously agitated carrier, the improvement wherein catalytically active material in an amount of from 1 to 40 g/minute/liter of carrier, and water in a weight ratio of catalytic material to water of from 1:1 to 30:1, are applied continuously and spatially separate from one another, each at a constant speed, onto the carrier particles, which may or may not have been pre-moistened with water in the amount of up to 95% of the particle absorbency, in such a way that the water content of the coating which forms is less than the maximum degree of saturation of the coating of catalytic material.

4,297,248

METHOD FOR PACKING CATALYSTS

Kazunobu Abe, Izumi; Tadao Nakatsuji, Matsubara, and Toshikatsu Umaba, Sakai, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Japan

Continuation of Ser. No. 27,440, Apr. 5, 1979, abandoned. This application Jul. 8, 1980, Ser. No. 167,099

Claims priority, application Japan, Apr. 15, 1978, 53-40738

Int. Cl.[3] B01J *35/04*

U.S. Cl. 252—477 R 3 Claims

1. A method of horizontally and vertically packaging a plurality of individual honeycomb catalyst units having through holes in the direction of an intended gas flow to form a composite catalyst structure having a plurality of through holes in the direction of an intended gas flow through the structure, which method comprises arranging the individual catalyst units in a manner such that the interface in the path of intended gas flow between two such catalyst units does not lie on the same plane as the interface in the path of intended gas flow between at least one vertically or horizontally adjacent pair of said catalyst units.

4,297,249

METHOD OF TREATING SILVER OXIDE POWDER AND THE PRODUCT FORMED THEREFROM

Franciszek J. Przybyla, Mississauga, and Eleanor J. Rossler, Lorne Park, both of Canada, assignors to Duracell International Inc., Bethel, Conn.

Filed Nov. 3, 1978, Ser. No. 957,597

Int. Cl.[3] H01B *1/06*

U.S. Cl. 252—518 13 Claims

1. The process of producing a silver oxide powder mixture for use in the cathode of an alkaline silver oxide galvanic cell, including the steps of partially reducing a mixture having at least 10% divalent silver oxide powder, the remainder including at least a minor amount of monovalent silver oxide powder, by reacting said silver oxide powder mixture with a reagent which is a fatty acid or a fatty acid salt where the fatty acid has a chain length of at least twelve carbon atoms, and removing the reagent from the reacted silver oxide powder mixture.

4,297,250

METHOD OF PRODUCING HOMOGENEOUS ZNO NON-LINEAR POWDER COMPOSITIONS

Tapan K. Gupta, Monroeville, Pa., and Herbert E. Pietsch, Mukwonago, Wis., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1980, Ser. No. 110,278

Int. Cl.[3] H01B *1/08*

U.S. Cl. 252—518 9 Claims

1. A method of making a ZnO powder composition, which can exhibit non-linear V-I characteristics, comprising the steps of:

(1) mixing:

(a) 75 mole % to 98 mole % of finely divided, ZnO particles and 2 mole % to 25 mole % of finely divided, additive particles effective to produce non-linear V-I characteristics, with

(b) an aqueous binder solution comprising an organic,

water soluble binder that will decompose at temperatures of between about 150° C. and 600° C., to provide a mixed particle-binder slurry, and then

(2) simultaneously dry, mix, agglomerating the slurry to form a mass of larger spherical particles, said particles containing binder, ZnO and additive compound distributed therethrough, and then

(3) pressing a mass of the agglomerated particles to provide a consolidated body, and then (4) heating the pressed body;

(a) first at a temperature rate increase effective to slowly decompose and remove the binder, and then,

(b) between about 1,050° C. and 1,400° C., for a time effective to sinter together the particles of the pressed body, forming additive doped ZnO grains within a body exhibiting non-linear V-I characteristics, and then

(5) crushing the sintered body to provide finely divided powder particle fragments, and then

(6) passing the finely divided particle fragments from the crushed sintered body through a means to measure particle size, in a manner effective to provide a powder fraction where substantially all of the particles in the powder fraction contain at least two attached additive doped ZnO grain fragments, providing a powder exhibiting non-linear V-I characteristics, where said fragments contain microfractures after crushing, and then

(7) heating the non-linear particles at a temperature of between 500° C. and 1,050° C., to eliminate any microfractures without re-sintering the particles.

3. The method of claim 1, where, as a last step, the non-linear ZnO powder is dispersed in a resinous medium, to provide a ZnO stress grading paint composition.

4,297,251

PROCESS FOR REMOVING HARD-TO-REMOVE SOILS FROM HARDWARE

Lowell W. Bernardino, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 2, 1977, Ser. No. 792,966

Int. Cl.³ C11D *1/12, 7/44*

U.S. Cl. 252—545 **2 Claims**

1. The process of removing hard-to-remove soils from housewares including pots, pans, dishes, glasses and utensils using aqueous solutions containing from about 0.1% to about 0.5% of a stable, single-phase light duty liquid detergent composition consisting essentially of:

(a) from about 5% to about 35% of a synthetic anionic surfactant having the formula $R—(Y)_n—(O)_nSO_3M$ wherein R is a group containing from 8 to about 24 carbon atoms which can be either straight or branched chain, saturated or unsaturated and attached either at the terminal position, a secondary position, or random attachment or mixtures thereof; Y is a group selected from the group consisting of $(OC_2H_4)_x$ where x is a number from 1 to 30; $(O—CH_2—CHOH—CH_2)_m$ wherein m is a number from 1 to 3; or a benzene ring, each n is either 0 or 1; and M is selected from the group consisting essentially of sodium; potassium; mono-, di-, or trialkanolammonium wherein the alkanol groups contain from 2 to 4 carbon atoms; mono-, di-, or trialkylammonium wherein the alkyl groups contain from 2 to 4 carbon atoms; ammonium; magnesium, calcium; or mixtures thereof;

(b) from 0% to about 15% of a suds boosting ingredient selected from the group consisting of amine oxide surfactants and amide surfactants;

(c) from 0.8% to about 5% of a detergency boosting ingredient which is a vegetable lecithin; and,

(d) water, the pH of the composition being above about 7.5 and less than about 8.5.

4,297,252

AGING-RESISTANT FIREPROOFING MATERIAL

Arndt C. Caesar, Frankenthal; Wolfram Koegel, Mannehelm; Ludwig Zuern, Bad Durkheim, and Friedheim Gaertner, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,521

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827828

Int. Cl.³ C09D *5/18;* **C09K** *3/28*

U.S. Cl. 252—606 **1 Claim**

1. A fireproofing material which retains excellent foaming properties on aging and which comprises

(A) 99–90 percent by weight of an alkali metal silicate containing 20–60 percent by weight of water;

(B) 1–10 percent by weight of an aluminate; and

(C) 2–20 percent by weight, based on the sum of A+B, of glass fibers.

4,297,253

METHOD OF MAKING MOLDABLE PRODUCT

Pierre Sorbier, Place de la Mairie, 84210 Pernes Les Fontaines, France

Filed Aug. 20, 1979, Ser. No. 68,144

Claims priority, application France, Sep. 1, 1978, 78 25291

Int. Cl.³ C08L *97/00;* **B05D** *7/00, 3/02*

U.S. Cl. 260—17.3 **8 Claims**

1. A process for manufacturing a moldable product composed of minute fibers of a ligneous material, said fibers having a length greater than their width, comprising the steps of: impregnating thin elongated slivers of the ligneous material with a polymerizable resin, then drying the slivers, then again impregnating the slivers with polymerizable resin, then again drying the slivers, and then homogenizing the slivers to reduce their size and form said minute fibers.

4,297,254

LOW TEMPERATURE CURING EPOXY RESIN

Martin P. Seidel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1979, Ser. No. 98,108

Int. Cl.³ C08G *59/50*

U.S. Cl. 260—18 EP **11 Claims**

1. A solventless anhydride-free liquid composition comprising:

(A) an oil-modified epoxy resin having an EEW of about 300 to about 600 which comprises the reaction product of:

(1) about 5 to about 50% of a triglyceride of a C_{10} to C_{20} fatty acid;

(2) about 50 to about 95% of an epoxy resin averaging at least one aliphatic hydroxyl group per molecule, an ash content of less than 0.1%, and an acid content of less than 0.01%; and

(3) about 0.01 to about 0.3 phr of a catalyst;

(B) up to about 80% of a glycidyl ether of a phenol;

(C) about 1 equivalent ±20%, per equivalent of epoxy resin, of menthane diamine; and

(D) about 0.02 to about 3% of an accelerator for said menthane diamine.

4,297,255

ADDUCT AND ITS USE

Hans-Uwe Schenck, Wachenheim, and Erich Gulbins, Heidelberg-Neuenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,437

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914085

Int. Cl.³ C08L *63/00;* **C09D** *3/58, 5/40*

U.S. Cl. 260—18 PF **12 Claims**

1. An adduct which has been obtained by reacting

(a) an epoxide compound selected from the group consisting

of glycidyl ether of a polyhydric alcohol or phenol, epoxidized oils and reaction products of aliphatic or aromatic polyepoxy resins with polyols or polyphenols with

(b) guanidine or a guanidine derivative using not less than 1 mole of guanidine or alkylguanidine or a guanidinium salt (b) per epoxide equivalent of the epoxide compound (a), and which may or may not have been partially or completely neutralized by adding an acid.

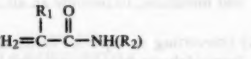
4,297,256

PREPARATION OF WATER-IMMISCIBLE, ACID-SOLUBLE N-(AMINOMETHYL)-α,β-ETHYLENICALLY UNSATURATED CARBOXAMIDES, QUATERNARY DERIVATIVES AND POLYMERS THEREOF

Charles J. McDonald, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 26, 1979, Ser. No. 106,823
Int. Cl.³ C08L *33/24*
U.S. Cl. 260—29.4 UA **15 Claims**

1. A process for preparing an acid soluble water-immiscible N-(aminomethyl)carboxamide (cationic carboxamide) which comprises (1) contacting a reaction mixture comprising an aqueous phase and a carboxamide reactant represented by the formula:



wherein R_1 is hydrogen or alkyl and R_2 is hydrogen or an inert substituent with an aldehyde having 1 to 3 carbons and a moderately water-soluble amine under conditions including a pH of less than about 7 sufficient to cause reaction of the carboxamide reactant, aldehyde and amine to form at least 5 mole percent of the water-immiscible cationic carboxamide based on moles of the carboxamide reactant and (2) thereafter increasing the pH of the resulting reaction mixture to a value of at least 7, thereby causing the water-immiscible cationic carboxamide to separate from the aqueous phase of the reaction mixture.

4,297,257

METAL STRIPPING COMPOSITION AND METHOD

Moenes L. Elias, Canfield, and Narendra K. Shah, Youngstown, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 17, 1980, Ser. No. 141,013
Int. Cl.³ C08L *33/26*; C09K *13/08*
U.S. Cl. 260—29.6 H **12 Claims**

1. An aqueous stripping solution which contains in solution from about 0.5% to about 35% of hydrogen peroxide, from about 5% to about 50% of a reactive composition of ammonia and hydrofluoric acid or a salt thereof, and from about 0.01% to about 10% of a polyacrylamide.

4,297,258

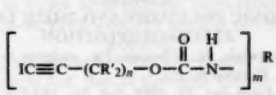
NON-YELLOWING PAINT FORMULATIONS CONTAINING IODO SUBSTITUTED ALKYNYL URETHANES AS FUNGICIDES

William P. Long, Jr., Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Apr. 28, 1980, Ser. No. 144,313
Int. Cl.³ C08K *5/16*
U.S. Cl. 260—29.6 MN **11 Claims**

1. A water-dispersible solvent solution concentrate for use as a fungicide in water-base coating systems having an aqueous phase and a binder resin phase which comprises:

(a) an iodo substituted low molecular weight alkyne urethane having the general formula:



wherein R is selected from the group consisting of substituted or unsubstituted alkyl, aryl or alkylaryl groups having from 1 to 20 carbon atoms and having from one to three linkages corresponding to m, and m and n are whole integers of from 1–3 and may be the same or different, and R′ is —H, methyl or alkyl radical which may be the same or different;

(b) a substantially water immiscible organic solvent;

(c) a surfactant selected from the group consisting of ionic and nonionic surfactants having an HLB in the range of 10–17.1 whereby said concentrate can be dispersed such that said iodo compound is not partitioned into said aqueous phase of said water-base coating systems.

4,297,259

SYNTHETIC POLYMER EMULSIFIER

John G. Papalos, Ledgewood, and Ronald W. Kavchok, Belle Mead, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 31,113, Apr. 18, 1979, Pat. No. 4,256,871. This application May 7, 1980, Ser. No. 147,383
Int. Cl.³ C08L *61/00*
U.S. Cl. 260—29.6 NR **8 Claims**

1. In the process of manufacturing a synthetic latex, using a recipe containing a diluent, a primary emulsifier, an initiator, at least one polymer monomer and a secondary emulsifier or co-emulsifier, with optionally, a chelating agent, an electrolyte and a chain transfer agent, the improvement comprising having present in the recipe an effective amount of a secondary emulsifier or co-emulsifier which is

a condensation product of 1 mole of naphthalenesulfonic acid, from about 0.1 to about 5 moles of linear alkylbenzenesulfonic acid having an alkyl moiety of from about 4 to about 20 carbon atoms, and from about 0.26 to about 3.1 moles of formaldehyde and salts thereof

thereby reducing secondary emulsifier or co-emulsifier pollution in polymer plant effluent.

4,297,260

ERASABLE WRITING MEDIUM COMPOSITION

William I. Ferree, Jr., and Giao V. Nguyen, both of Dallas, Tex., assignors to Liquid Paper Corporation, Dallas, Tex.

Filed Nov. 19, 1979, Ser. No. 95,574
Int. Cl.³ C08K *5/17*
U.S. Cl. 260—29.7 H **11 Claims**

1. A writing medium composition that is erasable by an ordinary pencil eraser and suitable for use in ballpoint or porous tip pens comprising:

(a) a carboxylated styrene-butadiene latex emulsion, said emulsion having a styrene-butadiene ratio of from about 40:60 to about 55:45, a viscosity of from about 50 to about 300 cps, a pH of from about 6 to about 10, a surface tension of from about 45 dynes per cm to about 72 dynes per cm and containing from about 40% to about 60% water by weight of said emulsion, said emulsion being further characterized by its ability to rapidly form a cohesive film at ambient temperature on a dry writing surface and having a low adhesion to paper to permit removal therefrom with an ordinary pencil eraser; and

(b) a basic dye that is a salt of a triarylmethyl cation which is dissolvable in said emulsion but which dye, when combined with said emulsion, does not, when said emulsion is applied to paper, penetrate into the paper fibers or paper voids sufficiently to form visible images on the paper.

4,297,261

CATIONIC POLYMERS AND THEIR USE IN ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 23, 1980, Ser. No. 162,225
Int. Cl.[3] C08L *63/10*
U.S. Cl. 260—29.7 RP 34 Claims

1. A stable, aqueous dispersion of a cationic polymeric product prepared by polymerizing in aqueous medium under free radical initiated addition polymerization conditions:

(A) an aqueous dispersed phase of a polymerizable, ethylenically unsaturated monomer composition, in the presence of

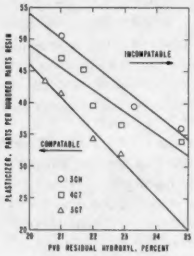
(B) an at least partially acid neutralized polyepoxide-primary and/or secondary amine adduct which contains pendent unsaturation.

4,297,262

POLYVINYL BUTYRAL PLASTICIZED WITH TETRAETHYLENEGLYCOL DI-N-HEPTANOATE

Thomas R. Phillips, Belpre, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1979, Ser. No. 71,537
The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.
Int. Cl.[3] C08K *5/10*
U.S. Cl. 260—31.6 5 Claims



1. A plastic composition comprising polyvinyl butyral and, in compatible admixture therewith, about from 20 to 55 parts per hundred of polyvinyl butyral of a plasticizer consisting essentially of tetraethyleneglycol di-n-heptanoate of the general formula:

$$CH_3(CH_2)_5C(=O)-O(CH_2CH_2O)_4C(=O)(CH_2)_5CH_3.$$

4,297,263

METHOD OF MAKING POLYPROPYLENE PRINTING PLATE USING PAPER MATRIX

Kinzo Miyamoto, Mitaka; Takayasu Tanaka, Tokyo, and Yoshimi Inoue, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo and Kabushikikaisha Asahi Shinbunsha, Osaka, both of, Japan

Filed Mar. 24, 1976, Ser. No. 669,817
Claims priority, application Japan, Apr. 2, 1975, 50-39262
Int. Cl.[3] C08K *5/20*
U.S. Cl. 260—32.6 PQ 2 Claims

1. A reproducing printing plate made by using a paper matrix, comprising a crystalline ethylene-propylene copolymer whose melt flow index is selected in a range of 3~10, which contains ethylene less than 20 weight % and which has the tensile yield strength of 220~330 kg/cm^2.

4,297,264

PROCESS FOR PREPARING ALKOXYLATED CROSS LINKING AGENTS BY PREPARING (A) AN AQUEOUS ALKANOLIC ALKOXYLATED AMINO RESIN (B) AZEOTROPIC DISTILLATION AND (C) DISTILLING EXCESS ALCOHOL

Robert S. De Ruiter, Downsview, and Stamatis M. Kambanis, Toronto, both of Canada, assignors to Reichhold Limited, Islington, Canada

Filed Jun. 6, 1980, Ser. No. 157,174
Claims priority, application Canada, Jun. 4, 1980, 353359
Int. Cl.[3] C08L *61/24;* C08G *12/06, 12/12, 12/32*
U.S. Cl. 260—33.4 R 13 Claims

1. A process for the preparation of an alkoxylated amino resin comprising:

(1) preparing an aqueous-alkanolic solution of an alkoxylated amino resin by either:

(a) converting an aqueous formaldehyde solution into an alcoholic formaldehyde-amino compound concentrate by admixing an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine, and an alkanol, and removing the water by azeotropic distillation, the alkanol having up to 8 carbon atoms inclusive and

(b) reacting the thus formed formaldehyde-amino compound concentrate with an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine, to provide an alkoxylated amino resin;

or:

(c) converting an aqueous formaldehyde solution into a formaldehyde-amino compound concentrate by admixing aqueous formaldehyde and an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine and removing the water by distillation; and

(d) reacting the thus formed formaldehyde-amino compound concentrate with an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine and an alkanol having up to 8 carbon atoms to provide an alkoxylated amino resin;

(2) removing the water remaining in the alkoxylated amino resin by azeotropic distillation with the alkanol; and

(3) removing excess remaining alkanol by distillation to provide a desired resin solids content.

4,297,265

SILICONE RUBBER COATING MATERIAL HAVING REDUCED SURFACE TENSION

Thomas O. Olsen, Wichita, Kans., assignor to Otto Fabric, Inc., Sedgwick County, Kans.

Filed Nov. 23, 1979, Ser. No. 96,940
Int. Cl.[3] C08K *5/01*
U.S. Cl. 260—33.6 SB 8 Claims

1. A composition for coating a substrate comprising:

a first component comprising silicone rubber and a solvent therefor, said silicone rubber comprising between 50% and 70% by weight of said first component; and

a second component comprising particulate SiO_2 having a particle size of less than 45 microns, said second component comprising 90 to 110% by weight of said first component.

4,297,266

MICROFILLED DENTAL COMPOSITE AND METHOD USING THE SAME

Robert L. Ibsen, and William R. Glace, both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.

Filed Feb. 8, 1980, Ser. No. 120,119
Int. Cl.[3] A61K *6/08;* C08K *3/26, 3/40, 9/06*
U.S. Cl. 260—42.14 11 Claims

1. A filled-resin dental composite consisting essentially of

Component	Parts by Weight
Ethoxylated bisphenol A dimethacrylate	53–17.5
Triethylene glycol dimethacrylate	4–13.5
Cure accelerator	0.25–1.0
Antioxidant	0.15–0.5
Curing agent	0.25–1.0
Ultra violet light absorbent	0.4–1.4
Sub-micron hydrophobic silica particles	10–30
Glass particles	20–67,

the silica particles ranging from about 0.1 micron to 0.04 micron in diameter and the glass particles ranging from about two to about thirty microns in diameter.

4,297,267

HEXAVALENT CHROMIUM INTERNAL COLORANTS FOR DIOL BIS (ALLYL CARBONATE) POLYMERIZATES

Ivan R. Leatherman, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1980, Ser. No. 118,357
Int. Cl.³ C08K *3/10, 3/18*
U.S. Cl. 260—42.53 **9 Claims**

1. A liquid composition comprising diol bis(allyl carbonate) monomer and chlorochromate ion.

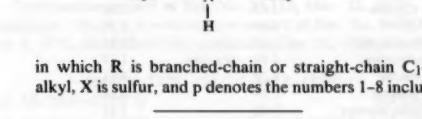
4,297,268

1,4-DIHYDRO-2,6 DIMETHYLYRIDINE-3,5-DICARBOXYLIC ACID ESTER COMPOSITIONS

Gerd Abeler, Griesheim über Darmstadt, and Rudolf Maul, Lorsch, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 958,760, Nov. 8, 1978, Pat. No. 4,214,088. This application Dec. 20, 1979, Ser. No. 105,796
Claims priority, application Switzerland, Nov. 11, 1977, 13799/77
Int. Cl.³ C08K *5/34*
U.S. Cl. 260—45.8 N **13 Claims**

1. A stabilized composition which comprises
(a) a chlorine-containing thermoplastic polymer, and
(b) from 0.5 to 2.5 percent by weight, relative to the total composition, of a compound of formula I



(I)

in which R is branched-chain or straight-chain C_1–C_{20} alkyl, X is sulfur, and p denotes the numbers 1–8 inclusive.

4,297,269

N,N'-BIS(1-CYCLOHEXYL-1-ETHYL)-P-PHENYLENEDIAMINE, AND RUBBER COMPOUNDS CONTAINING THE SAME

Helmut L. Merten, Hudson, and Gene R. Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 16, 1980, Ser. No. 197,400
Int. Cl.³ C08K *5/18;* C07C *87/38*
U.S. Cl. 260—45.9 QB **8 Claims**

1. N,N'-bis(1-cyclohexyl-1-ethyl)-p-phenylenediamine.

2. A vulcanizable rubber compound containing a stabilizing amount of N,N'-bis(1-cyclohexyl-1-ethyl)-p-phenylenediamine.

4,297,270

MANUFACTURE AND USE OF NON-IONOGENIC INTERFACE-ACTIVE AGENTS BASED ON MODIFIED ROSINS

Heinz Uhrig, Steinbach, and Reinhold Deubel, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 75,034
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840113; Jun. 16, 1979, 2924354
Int. Cl.³ C09F *1/04;* D06M *15/02*
U.S. Cl. 260—104 **8 Claims**

1. A compound of the formula

$$A[(X—O)_n—H]_m$$

wherein
A is a cycloalkyl-, aralkyl- or aryl-modified rosin acid radical or a radical of an ester of a polyhydric alcohol with such an acid,
X stands for the same or different group or groups of, the formulae

$$—CH_2—CH_2—$$

or

$$—CH_2—CH(CH_3)—,$$

n is a number of from 1 to 100 and
m is an integer of from 1 to 5.

4,297,271

GUAIACONIC ACID A FROM GUAIAC RESIN

Werner Guthlein, Mannheim-Neckarau; Hans Wielinger; Walter Rittersdorf, both of Mannheim-Waldhof, and Wolfgang Werner, Mannheim-Vogelstang, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Division of Ser. No. 892,359, Mar. 31, 1978, Pat. No. 4,219,336. This application Jan. 25, 1980, Ser. No. 115,533
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716061
Int. Cl.³ C08L *93/00;* C08K *5/24;* C09F *1/02*
U.S. Cl. 260—107 **3 Claims**

1. Guaiaconic acid A, having a specific extinction $E_{1\,cm}^{1\%}$ at 600 nm of ... least 200, determined by the reaction with peroxidase and hydrogen peroxide, having infra-red bands at
1600 cm^{-1} (m);
1505 cm^{-1} (v.s.);
1206 cm^{-1} (s;b);
1115 cm^{-1} (m);
1025 cm^{-1} (m); and
1200 cm^{-1} (s;b)
and having an R_F value of 0.45 (toluene/dioxan/glacial acetic acid; 90:25:10 v/v/v).

3. Process for the preparation of guaiaconic acid A which comprises dissolving natural guaiac resin in acetone, removing the residue obtained by the addition of toluene, evaporating the remaining solution to dryness, dissolving the evaporation residue in n-heptane/ethyl acetate or toluene/acetone, separating the solution chromatographically over a column containing neutral silica gel, which has been pretreated with acid, using n-heptane/ethyl acetate or toluene/acetone, collecting and evaporating the fractions with R_F=0.45 (toluene/dioxan/glacial acetic acid; 90:25:10 v/v/v) and recrystallizing the evaporation residue from xylene.

4,297,272

PROCESS FOR THE PREPARATION OF PURIFIED BACTERIAL MEMBRANAL PROTEOGLYCANS

Lucien D. D'Hinterland; Gerard Normier; Anne-Marie Pinel, and Jacques Durand, all of Castres, France, assignors to Pierre Fabre S.A., France

Filed Dec. 13, 1979, Ser. No. 103,202
Claims priority, application France, Dec. 19, 1978, 78 35649
Int. Cl.[3] C07G 7/00; A61K 39/108, 39/02
U.S. Cl. 260—112 R 8 Claims

1. A process for the preparation of purified water soluble bacterial membranal proteoglycans which comprises at least one step in which crude proteoglycans are treated in an aqueous medium with a reactant selected from the group consisting of bases and hypobromites, followed by removal of the excess reactant and the insoluble residue, the purified proteoglycans being present in aqueous solution.

4,297,273

CHEMILUMINESCENT PHTHALHYDRAZIDE-LABELED PROTEIN AND POLYPEPTIDE CONJUGATES

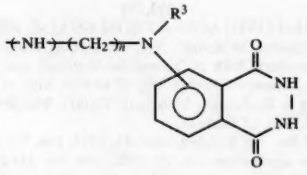
Robert T. Buckler, Edwardsburg, Mich., and Hartmut R. Schroeder, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 927,621, Jul. 24, 1978. This application Jan. 14, 1980, Ser. No. 111,809
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—112 B 10 Claims

1. In a chemiluminescent-labeled conjugate for use in specific binding assays of the general formula:

L(CO—NH) labeling substance

wherein L(CO—NH) is an antigenic protein or polypeptide bound to said labeling substance through an amide bond, characterized in that said —NH) labeling substance has the formula:



wherein R^3 is hydrogen or straight chain alkyl containing 1–4 carbon atoms and n=2–8.

4,297,274

PROTEIN FROM RED BLOOD CELLS AND PROCESS FOR ISOLATING IT

Hans Bohn, and Heinz Haupt, both of Marburg an der Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 898,519, Apr. 20, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,253
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1977, 2718326
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—112 B 8 Claims

1. A process for isolating a protein characterized by

(a) a protein content of 99%±1% and a content of carbohydrates of 0.9%±0.5%, and a compositional analysis including the following major amino-acid and carbohydrate fractions:

Amino Acids	Mol %	Variation Coefficient %
Aspartic acid	11.39	1.21
Glutamic acid	8.44	4.35

-continued

Amino Acids	Mol %	Variation Coefficient %
Glycine	9.13	2.22
Alanine	7.35	1.68
Valine	8.96	1.36
Leucine	8.79	3.83

Carbohydrates	% by weight
Hexoses (Gal/Man 1:1)	0.9 ± 0.2
Acetylhexoseamine	0.3 ± 0.1;

(b) a sedimentation coefficient $S_{20w}{}^{C=O}$ of 6.88±0.5S;

(c) a molecular weight of 160,000±15,000;

(d) an iso-electric point of 5.5±0.2;

(e) an electrophoretic mobility in the range of the β_1-globulins of human serum; and

(f) a specific immunological reaction with an antibody specifically directed against the protein,

which process comprises extracting the protein from red blood cells or from an aqueous solution having an electrical conductivity of from 1 to 10 μS/cm and containing the protein; adsorbing said protein from the aqueous solution on an anion exchanger at a pH value of between 6.5 and 7.5, thereby separating the protein from the supernatant of said aqueous solution; treating the anion exchanger and adsorbed protein with a series of salt solutions of varying concentration to elute that which was adsorbed on the exchanger in various fractions; identifying each fraction containing the protein; concentrating the protein by ultra-filtration; fractionating the concentrate by gel-filtration and elution; identifying each resultant fraction containing the protein, and concentrating the protein by ultrafiltration.

5. An isolated, concentrated, protein obtained by fractionating an extract of blood or of a blood-rich organ, said protein having

(a) a protein content of 99%±1% and a content of carbohydrates of 0.9%±0.5%, and a compositional analysis as follows:

Amino Acids	Mol %	Variation Coefficient %
Lysine	6.68	2.67
Histidine	1.61	5.08
Arginine	5.05	3.97
Aspartic acid	11.39	1.21
Threonine	5.05	2.23
Serine	4.98	4.12
Glutamic acid	8.44	4.35
Proline	5.66	6.95
Glycine	9.13	2.22
Alanine	7.35	1.68
½ Cystine	1.65	2.04
Valine	8.96	1.36
Methionine	0.32	28.87
Isoleucine	4.84	1.17
Leucine	8.79	3.83
Tyrosine	3.34	4.24
Phenylalanine	5.92	3.81
Tryptophan	1.01	10.30

Carbohydrates	% by weight
Hexoses (Gal/Man 1:1)	0.9 ± 0.2
Acetylhexoseamine	0.3 ± 0.1
Acetyl-neuraminic acid	0
Fucose	0

(b) a sedimentation coefficient $S_{20w}{}^{C=O}$ of 6.88±0.5S;

(c) a molecular weight of 160,000±15,000;

(d) an iso-electric point of 5.5±0.2;

(e) an electrophoretic mobility in the range of the β_1-globulins of human serum; and
(f) a specific immunological reaction with an antibody specifically directed against the protein.

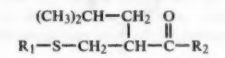
4,297,275

INHIBITORS OF MAMMALIAN COLLAGENASE

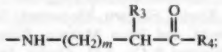
Joseph E. Sundeen, Yardley, Pa., and Tamara Dejneka, Skillman, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 51,195, Jun. 25, 1979, Pat. No. 4,235,885. This application Feb. 14, 1980, Ser. No. 121,352
Int. Cl.[3] **C07C** *103/52;* **C07G** *7/00;* **C07C** *147/02*
U.S. Cl. 260—112.5 R **22 Claims**

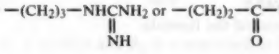
1. A compound having the formula



or a salt thereof wherein
R_1 is hydrogen or alkanoyl of 2 to 10 carbon atoms;
R_2 is hydroxy, or



R_3 is hydrogen, alkyl of 1 to 4 carbon atoms,



R_4 is hydroxy, amino, arginine, leucine, glutamine, alanine or glycine; and
m is 0 or an integer of 1 to 9.

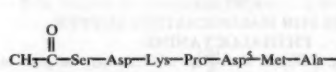
4,297,276

THYMOSIN BETA 3 AND BETA 4

Allan L. Goldstein, Washington, D.C., and Teresa L. K. Low, Annandale, Va., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 23,115, Mar. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 967,675, Dec. 8, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,430
Int. Cl.[3] **C07C** *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **2 Claims**

1. Thymosin β_3 being a polypeptide essentially free of other thymic polypeptides and having the following amino acid sequence:



-Lys-Phe-Asp-Lys-Ser[15]-Lys-
-Leu-Lys-Lys-Thr[20]-Glu-Thr-Gln-Glu-Lys[25]-Asn-
Pro-Leu-Pro-Ser[30]-Lys-Glu-Thr-Ile-Glu[35]-Gln-Glu
-Lys-Gln-Ala[40]-Gly-Glu-Ser-(Asx, Glx, Ile, Thr)Ala-Lys-Thr[50]-OH

and the pharmaceutically acceptable acid addition salts or base salts thereof.

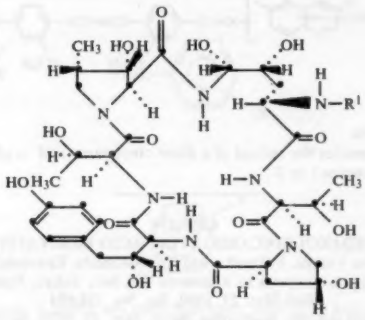
4,297,277

DERIVATIVES OF A-30912B NUCLEUS

Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

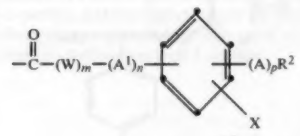
Continuation-in-part of Ser. No. 103,018, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,434
Int. Cl.[3] **C07C** *103/52;* **A61K** *37/00;* **C12P** *21/04*
U.S. Cl. 260—112.5 R **40 Claims**

1. A compound of the formula:

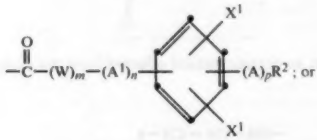


wherein R^1 is a group of the formula:

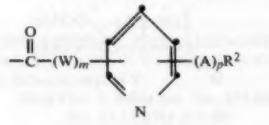
(a)



(b)



(c)



wherein A is divalent oxyben, sulfur, sulfinyl, or sulfonyl; A^1 is divalent oxygen, sulfur, sulfinyl, sulfonyl or —NH—; X is hydrogen, chloro, bromo, iodo, nitro, C_1–C_3 alkyl, hydroxy, C_1–C_3 alkoxy, mercapto, C_1–C_3 alkylthio, carbamyl or C_1–C_3 alkylcarbamyl; X^1 is chloro, bromo or iodo; R^2 is hydrogen, C_1–C_{18} alkyl or C_2–C_{18} alkenyl; W is C_1–C_{10} alkylene or C_2–C_{10} alkenylene; m, n and p are 0 or 1, but if m=0, n must=0; provided: that the sum of the carbon atoms in the R^2 and W groups must be greater than 4 but cannot exceed 21; that when X is mercapto, A and A^1 cannot be sulfinyl or sulfonyl and that when A and A^1 are sulfinyl or sulfonyl, they must be in equal oxidation states.

4,297,278

PENTAKIS-AND HEPTAKIS-AZOXY DYESTUFFS

Horst Nickel, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

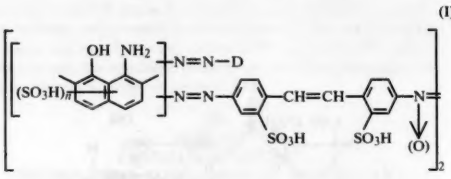
Filed Mar. 7, 1980, Ser. No. 128,201

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910458

Int. Cl.[3] **C09B** *57/00;* **C07C** *105/00;* **D06P** *3/24, 3/32*

U.S. Cl. 260—143 **4 Claims**

1. A polyazo dyestuff of the formula



(I)

wherein

D denotes the radical of a diazo component and

n denotes 1 or 2.

4,297,279

IMIDAZOLEDICARBOXYLIC ACID DERIVATIVE

Naohiko Yasuda, Yokosuka, and Eiji Nakanishi, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

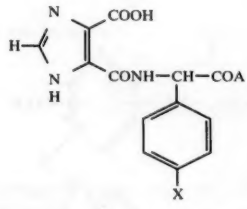
Filed Mar. 27, 1980, Ser. No. 134,681

Claims priority, application Japan, Mar. 27, 1979, 54-36133

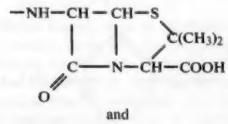
Int. Cl.[3] **C07D** *499/04, 501/02, 487/04*

U.S. Cl. 260—239.1 **5 Claims**

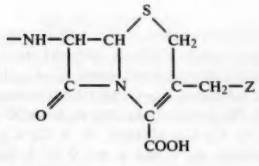
2. A process for producing a compound having the formula:



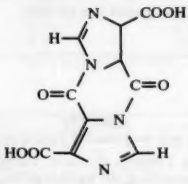
wherein A is an organic radical selected from the group consisting of



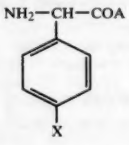
and



wherein Z is a radical selected from the group consisting of hydrogen, acyloxy, carbamoyloxy, heteroaromaticthio and quaternary am: onium, and X is a radical selected from the group consisting of hydrogen and hydroxyl, which comprises reacting an imidazoledicarboxylic acid derivative having the following formula:



with a compound having the following formula:



wherein A and X are as defined above.

4,297,280

4,1-BENZOXAZEPINES

Kentaro Hirai, Kyoto; Shigeru Matsutani, Sakai; Teruyuki Ishiba, Takatsuki, and Itsuo Makino, Kobe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

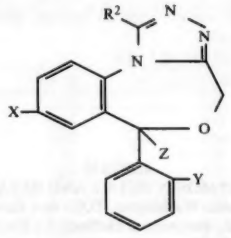
Filed Nov. 6, 1979, Ser. No. 91,814

Claims priority, application Japan, Nov. 27, 1978, 53-146949

Int. Cl.[3] **C07D** *498/04*

U.S. Cl. 260—245.5 **11 Claims**

1. A compound of the formula:



wherein

R^2 is C_1 to C_3 alkyl or C_1 to C_3 α-aminoalkyl,

X is halogen or nitro,

Y is hydrogen or halogen, and

Z is hydrogen, C_1 to C_3 alkoxy or C_3 to C_9 dialkylaminoalkoxy;

or a pharmaceutically acceptable acid addition salt thereof.

4,297,281

PROCESS FOR HALOGENATING COPPER PHTHALOCYANINE

Diether Wessling, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,935

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901859

Int. Cl.[3] **C09B** *47/04*

U.S. Cl. 260—314.5 **2 Claims**

1. A process for halogenating copper phthalocyanine to a halogen content of about 14 to about 15.5 halogen atoms per

CuPc molecule, in an aluminium chloride/sulphuryl chloride mixture which contains 8 to 25% by weight, relative to the amount of $AlCl_3$, of an anhydrous alkali metal halide, characterised in that the $AlCl_3/SO_2Cl_2$ mixture contains 70 to 150% by weight, relative to the amount of $AlCl_3$, of sulphuryl chloride and the halogenation is carried out under an excess pressure of 1 to 20 bars.

4,297,282

RESOLUTION OF MERCAPTOPROPIONIC ACIDS

Naohito Ohashi, Nishinomiya; Shoji Nagata, and Junki Katsube, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

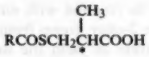
Filed Nov. 2, 1979, Ser. No. 90,857

Claims priority, application Japan, Mar. 2, 1979, 54-24820; Mar. 2, 1979, 54-24821; Mar. 13, 1979, 54-29548; Jun. 28, 1979, 54-82412; Jul. 25, 1979, 54-95228

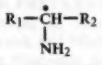
Int. Cl.[3] **C07D** *207/16;* **C07C** *153/017*

U.S. Cl. 260—326.2 **9 Claims**

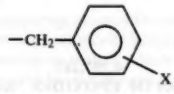
1. A process for the optical resolution of DL-α-methyl-β-acylthiopropionic acid, which comprises contacting a DL-α-methyl-β-acylthiopropionic acid of the formula,



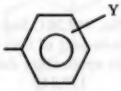
wherein R is a lower alkyl, phenyl or substituted phenyl bearing a methyl or chloro radical, with an optically active amine of the formula,



wherein R_1 is methyl and R_2 is α-naphthyl or R_1 is

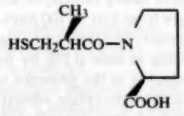


and R_2 is

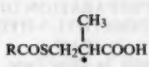


(wherein X and Y are each hydrogen, methyl or halogen) to form diastereoisomeric salts, subjecting the formed diastereoisomeric salts to fractional crystallization in an organic solvent to separate the D-acid salt from the L-acid salt, and then contacting the individual diastereoisomeric salts with acid to give D-α-methyl-β-acylthiopropionic acid and L-α-methyl-β-acylthiopropionic acid.

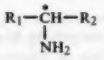
9. A process for producing captopril of the formula,



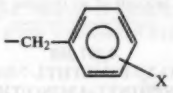
which comprises (A) contacting DL-α-methyl-β-acylthiopropionic acid of the formula,



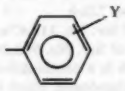
wherein R is lower alkyl, phenyl or substituted phenyl bearing methyl or chloro radical with an optically active amine of the formula,



wherein R_1 is methyl and R_2 is α-naphthyl or R_1 is



and R_2 is



(wherein X and Y are each hydrogen, methyl or halogen) to form diastereoisomeric salts, subjecting the product to fractional crystallization to separate the D-acid salt from the L-acid salt, and then contacting the thus obtained D-acid salt with an acid to give D-α-methyl-β-acylthiopropionic acid, (B) reacting the resulting D-α-methyl-β-acylthiopropionic acid with thionyl chloride to form its acid chloride, subjecting the resulting acid chloride to condensing reaction with L-proline in the presence of a base to give N-(D-α-methyl-β-acylthiopropionyl)-L-proline, and (C) deacylating of the resulting N-(D-α-methyl-β-acylthiopropionyl)-L-proline with a base to give N-(D-α-methyl-β-thiopropionyl)-L-proline.

4,297,283

CHLORINATION OF PHTHALIC ANHYDRIDE

John W. Verbicky, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,669

Int. Cl.[3] **C07D** *307/89*

U.S. Cl. 260—346.3 **7 Claims**

1. The process for chlorinating phthalic anhydride to produce a predominantly monochlorinated compound containing a single chlorine in the 4-position so that the molar ratio of chlorine in the 4-position as contrasted to chlorine in the 3-position ranges from 5 to 11 molar equivalents of the former per molar equivalent of the 3-position compound, which process comprises passing chlorine and phthalic anhydride in the vapor phase with an inert gas, in the absence of a chlorination catalyst, through a reaction chamber maintained at a temperature above 350° C., but below 600° C., and thereafter isolating the 4-substituted phthalic anhydride.

4,297,284

PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURAN

Daniel Michelet, Tassin la Demi-Lune, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

Continuation of Ser. No. 170,977, Jul. 18, 1980, abandoned. This application Jul. 22, 1980, Ser. No. 171,087

Claims priority, application France, Jul. 18, 1979, 79 19127

Int. Cl.[3] C07D *307/86*

U.S. Cl. 260—346.22 **14 Claims**

1. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran, comprising heating a member selected from the group consisting of 3-isobutenyl-1,2-dihydroxybenzene, and admixture of at least 10% by weight of 3-isobutenyl-1,2-dihydroxybenzene with 3-methallyl-1,2-dihydroxybenzene, at cyclization/isomerization temperatures, in the presence of a catalytic amount of an organic sulfonic acid.

4,297,285

2,3-DIHYDRO-2,3-DIMETHYL-7-BENZOFURYL N-[(PHOSPHINYL)AMINO]THIO- AND N-[(PHOSPHINOTHIOYL)AMINO]THIO-METHYLCARBAMATES

Stephen J. Nelson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 115,474, Jan. 25, 1980, which is a continuation-in-part of Ser. No. 962,266, Nov. 20, 1978, Pat. No. 4,208,409, which is a continuation-in-part of Ser. No. 874,959, Feb. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 765,807, Feb. 4, 1977, Pat. No. 4,081,536. This application Jul. 31, 1980, Ser. No. 174,049

The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.

Int. Cl.[3] C07D *307/86*

U.S. Cl. 260—346.73 **34 Claims**

1. 2,3-dihydro-2,2-dimethyl-7-benzofuranyl methyl[[(methyl)(5,5-dimethyl-2-thioxo-1,3,2-dioxaphosphorinan-2-yl)-amino]thio]carbamate.

4,297,286

PROCESS FOR SELECTIVELY PRODUCING ISOSORBIDE-5-NITRATE

Klaus Sandrock, Langenfeld, and Günter Cordes, Leichlingen, both of Fed. Rep. of Germany, assignors to Sanol Schwarz-Monhein GmbH, Monhein, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 114,906

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903927

Int. Cl.[3] C07D *307/00*

U.S. Cl. 260—347.8 **6 Claims**

1. A process for preparing isosorbide-5-nitrate comprising

(a) reacting isomannide in an organic solvent or in an aqueous-organic reaction medium with an equivalent amount of a compound selected from the group consisting of:

(1) the acid halogenides of an aromatic sulfonic acid of the general formula I

I

wherein A is a benzene or a naphthalene ring, R is a lower alkyl group with 1 to 4 carbon atoms, a lower alkoxy group with 1 to 4 carbon atoms or a halogen, and n is a numeral from 0 to 3,

(2) a perfluoroalkanesulfonic acid with 1 to 4 carbon atoms or anhydride thereof,

(3) an alkanesulfonic acid with 1 to 4 carbon atoms or anhydride thereof,

(4) a perfluoroalkanoic acid with 1 to 4 carbon atoms or anhydride thereof,

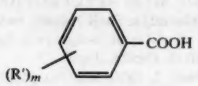
(5) a carbamic acid, and

(6) sulphurous acid;

(b) reacting the resulting isomannide-2-ester in the presence of a solvent with a compound selected from the group consisting of:

(1) the alkali metal and ammonium salts of a benzoic acid of the general formula II

II



wherein R′ is a lower alkyl group with 1 to 4 carbon atoms, a lower alkoxy group with 1 to 4 carbon atoms or a halogen, and m is a numeral from 0 to 3, and

(2) a lower alkanoic acid with 1 to 4 carbon atoms in the alkane group, at a temperature sufficient to produce an isosorbide-2-ester,

(c) converting the hydroxy group in the 5-position of the resulting isosorbide-2-ester into the nitrate group by subjecting the ester to reaction with nitric acid, and

(d) splitting off the 2-ester group from the resulting isosorbide-2-ester-5-nitrate to yield the isosorbide-5-nitrate by hydrolysis in an aqueous organic solvent with an alkali metal hydroxide or by alcoholysis in an organic solvent comprising an alcohol with an alkali metal hydroxide.

4,297,287

PRODUCTION OF EPOXIDES FROM LOWER ALKANE-1,2-DIOLS

Michel Costantini, Lyons, and Michel Jouffret, Francheville-le-Bas, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 942,361, Sep. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 889,732, Mar. 24, 1978, abandoned. This application Jun. 10, 1980, Ser. No. 158,317

Claims priority, application France, Mar. 24, 1977, 77 10140

Int. Cl.[3] C07D *301/02*

U.S. Cl. 260—348.16 **21 Claims**

1. A process for the preparation of a lower alkylene oxide, which comprises dehydrating a lower alkane-1,2-diol selected from the group consisting of ethylene glycol and propylene glycol, in liquid phase, under a pressure of at least atmospheric, at a temperature of from 200° to 400° C., and in the presence of a mixture comprising at least one heavy carboxylic acid and at least one alkali metal or alkaline earth metal carboxylate, wherein the amount of heavy carboxylic acid present per mole of carboxylate ranges from 0.01 to 100 mols and the concentration of the heavy carboxylic acid/carboxylate admixture in the reaction mixture being at least 0.1% by weight, wherein the dehydration is conducted in the presence of a solvent for the heavy carboxylic acid/carboxylate admixture, selected from the group consisting of poly (oxyalkylene) glycols, ethers, alkylbenzenes and polyphenyls, and wherein the product epoxide is continuously removed as it is formed.

4,297,288

5-AMINO-1,2,3,4-TETRAHYDROANTHRAQUINONE AND ITS PREPARATION

Serge Y. Delavarenne, Francheville Le Haut; Bernard Dubreux, Francheville Le Bas, and Pierre Tellier, Sainte Foy Les Lyon, all of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jan. 14, 1980, Ser. No. 112,002
Claims priority, application France, Jan. 19, 1979, 79 01326
Int. Cl.³ C07C *97/24*
U.S. Cl. 260—378 **10 Claims**

1. 5-amino-1,2,3,4-tetrahydroanthraquinone, as a new industrial product.

4,297,289

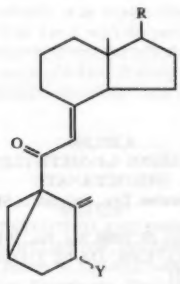
VITAMIN D COMPOUNDS ISOTOPICALLY SUBSTITUTED AT CARBON 6 AND PROCESS FOR THEIR PREPARATION

Hector F. DeLuca; Heinrich K. Schnoes, both of Madison; Herbert E. Paaren, Verona, and Mary A. Fivizzani, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 17, 1980, Ser. No. 169,567
Int. Cl.³ C07J *9/00*
U.S. Cl. 260—397.2 **28 Claims**

1. A method for preparing vitamin D- and 5,6-trans vitamin D-compounds which are isotopically labeled at carbon 6 of the molecule with deuterium or tritium which comprises,

reducing, a compound having the general formula



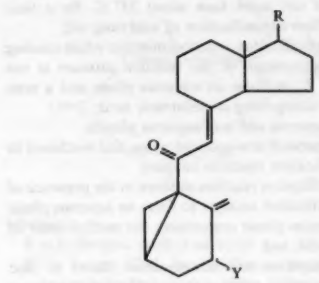
where R represents the sidechain as desired in the labeled product and Y is hydrogen, hydroxy or protected-hydroxy

with a tritio-or deutero-borohydride reducing reagent, whereby the corresponding 6-deutero- or 6-tritio-substituted-6-hydroxy product is obtained

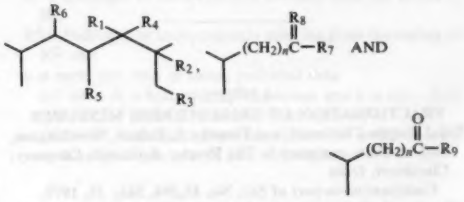
subjecting said reduction product to acid catalyzed solvolysis, whereby the 6-deutero- or 6-tritio-vitamin D and 5,6-trans vitamin D compound is obtained, and

recovering the desired labeled product.

7. Compounds having the formula



wherein Y is hydrogen, hydroxy or protected-hydroxy, and R is selected from the group consisting of hydrogen, alkyl



wherein each of R_1, R_2 and R_3 is selected from the group consisting of hydrogen, hydroxy, protected-hydroxy, alkyl and fluoro, and where R_1 and R_2 or R_2 and R_3, when taken together, form an epoxide, acetonide, or cyclic-O-boronate grouping, R_4 is hydrogen or alkyl, R_5 and R_6 are hydrogen or, when taken together, form a double bond, except that R_1, R_2, R_3, R_4, R_5 and R_6 may not all be hydrogen when Y is hydrogen, R_7 is selected from the group consisting of hydrogen and alkyl, R_8 represents a carbonyl or protected-carbonyl group, R_9 is selected from the group consisting of hydroxy and O-alkyl, and n is 1, 2 or 3.

4,297,290

PROCESS FOR PREPARING SORBITAN ESTERS

George J. Stockburger, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jul. 17, 1980, Ser. No. 169,768
Int. Cl.³ C09F *5/08*
U.S. Cl. 260—410.6 **8 Claims**

1. A process for preparing a sorbitan fatty acid ester or mixture thereof which comprises reacting an anhydro sorbitol containing a preponderance of sorbitans with a fatty acid in the presence of an alkaline catalyst at a temperature from about 180° to about 215° C., the amount of said catalyst not exceeding the equivalent of about 1% of NaOH, based on product weight, thereby producing said sorbitan fatty acid ester or mixture thereof.

4,297,291

METHOD OF PREPARING THE METHYL ESTER OF α-ELEOSTEARIC ACID

Joseph E. Lionelle, and Jeffrey A. Staffa, both of Salida, Colo., assignors to Bio Systems Research, Inc., Salida, Colo.

Filed Jun. 30, 1980, Ser. No. 164,567
Int. Cl.³ C09F *5/02*; C11C *3/02*
U.S. Cl. 260—410.9 R **13 Claims**

1. A method of preparing the methyl ester of α-eleostearic acid which comprises:

providing a reaction mixture comprising tung oil, methanol, water and a saponification agent;

maintaining the temperature of said reaction mixture at a temperature of not more than about 35° C. for a time sufficient to effect saponification of said tung oil;

acidifying the saponification reaction mixture while cooling to maintain temperature of the reaction mixture at not more than 35° C. to form an aqueous phase and a non-aqueous phase comprising α-eleostearic acid;

separating said aqueous and non-aqueous phases;

admixing said separated non-aqueous phase and methanol to form an esterification reaction mixture;

heating said esterification reaction mixture in the presence of an acidic esterification catalyst to form an aqueous phase and a non-aqueous phase comprising the methyl ester of α-eleostearic acid; and

separating said aqueous and non-aqueous phases of said esterification reaction mixture to provide a non-aqueous product phase comprising the methyl ester of α-eleostearic acid.

4,297,292

FRACTIONATION OF TRIGLYCERIDE MIXTURES

Ted J. Logan, Cincinnati, and Timothy A. Lubsen, Worthington, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 43,394, May 25, 1979, abandoned. This application Mar. 26, 1980, Ser. No. 134,029

Int. Cl.³ C09F *5/10*

U.S. Cl. 260—428.5 **17 Claims**

1. A process for separating a mixture of triglycerides with different Iodine Values and having their carboxylic acid moieties containing from 6 to 26 carbon atoms, to produce fractions of higher Iodine Value and lower Iodine Value, said process comprising the steps of

(a) contacting a solution of said mixture in solvent with macroreticular strong acid cation exchange resin to selectively adsorb triglyceride of higher Iodine Value and to leave in solution a fraction of said mixture enriched in content of triglyceride of lower Iodine Value,

(b) removing solution of fraction enriched in content of triglyceride of lower Iodine Value from contact with resin which has selectively adsorbed triglyceride of higher Iodine Value,

(c) contacting resin which has selectively adsorbed triglyceride of higher Iodine Value with solvent to cause desorption of adsorbed triglyceride and provide a solution in solvent of fraction enriched in content of trigylceride of higher Iodine Value,

(d) removing solution of fraction enriched in content of triglyceride of higher Iodine Value from contact with resin;

the solvent in step (a) and the solvent in step (c) being of the same or of different composition and being characterized by a solubility parameter (on a 25° C. basis) ranging from about 7.0 to about 15.0, a solubility parameter dispersion component (on a 25° C. basis) ranging from about 7.0 to about 9.0, a solubility parameter polar component (on a 25° C. basis) ranging from 0 to about 6.0 and a solubility parameter hydrogen bonding component (on a 25° C. basis) ranging from 0 to about 11.5; said resin having its exchangeable cation substituents consisting essentially of from about 3% to 100% of metal cation substituents capable of forming π complexes, the balance being metal ions incapable of forming π compexes; the solvent in step (a) and the solvent in step (c) and the percentage of metal cation substituents capable of forming π complexes being selected to provide selectivity in step (a) and desorption in step (c).

4,297,293

SODIUM ALUMOGLUCOHEPTONATE AND A PROCESS FOR ITS PREPARATION

Peter Suhac; Natasa Hafner-Milac, and Bozidar Dolenc, all of Ljubljana, Yugoslavia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov. n.sol.o., Ljubljana, Yugoslavia

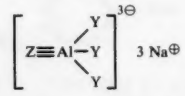
Filed Feb. 6, 1980, Ser. No. 118,952

Claims priority, application Yugoslavia, Feb. 14, 1979, 354/79

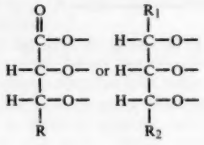
Int. Cl.³ C07F *5/06*

U.S. Cl. 260—448 B **11 Claims**

1. Sodium alumoglucoheptonate of the general formula



wherein Z represents a residue of the formula



wherein

R represents a residue of a molecule of sodium D-glycero-D-gulo-heptonate or of sodium D-glycero-D-ido-heptonate and

R_1 and R_2 represent moieties of a molecule of sodium D-glycero-D-gulo-heptonate or of sodium D-glycero-D-ido-heptonate,

Y represents a hydroxy group or three Y are joined to represent the residue Z.

2. A process for the preparation of sodium alumoglucoheptonate characterized in that a solution of sodium aluminate is added to the solution of sodium glucoheptonate in such a quantity that the ratio between the number of aluminum atoms and the number of sodium glucoheptonate molecules amounts to from 0.50:1 to 1.50:1.

4,297,294

PROCESS FOR MAKING 4,4'-METHYLENE DIPHENYL DIISOCYANATE

Frank D. Mango, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 29, 1980, Ser. No. 191,889

Int. Cl.³ C07C *118/02, 119/048*

U.S. Cl. 260—453 PH **9 Claims**

1. A process for the selective production of 4,4'-methylene diphenyl diisocyanate and corresponding oligomers, consisting essentially of the steps of:

(a) condensing formaldehyde with aniline under neutral or basic conditions to yield an anil condensate;

(b) reacting said anil condensate with aniline and a protonic salt of aniline under acidic conditions to yield an intermediate product selected from the group consisting of 4,4'-methylene dianiline, its corresponding oligomers and mixtures thereof; and

(c) reacting said intermediate product with phosgene to yield the corresponding diisocyanate or polysiocyanate.

4,297,295
N-(BENZENESULFONYL) THIOCARBAMATES-HERBICIDAL ANTIDOTES

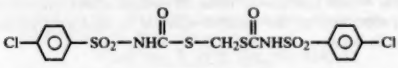
Edmund J. Gaughan, Berkeley, and Charles Kezerian, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 723,251, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 619,115, Oct. 2, 1975, abandoned. This application Dec. 31, 1979, Ser. No. 108,890

Int. Cl.³ C07C *155/02*

U.S. Cl. 260—455 A **1 Claim**

1. The compound having the formula



4,297,296
QUATERNIZED POLYAMINES

Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

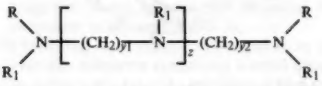
Filed Jun. 21, 1979, Ser. No. 50,881

Claims priority, application Switzerland, Jun. 26, 1978, 6933/78

Int. Cl.³ C07C *87/28, 87/29*

U.S. Cl. 260—459 A **8 Claims**

1. A quaternized polyamine having the basic structure of formula I



I

in which

each R, independently, is (C_{10-22})alkyl, (C_{10-22})alkenyl, phenyl(C_{1-3})alkyl or naphthyl(C_{1-3})alkyl,

each R_1, independently, is phenyl(C_{1-3})alkyl or naphthyl (C_{1-3})alkyl,

z is 1 to 5,

each y_1, independently, is an integer from 2 to 8,

y_2 is an integer from 2 to 8, with the proviso that when $z=1$ $y_1 \neq y_2$ and when $z>1$ and the y_1's are the same $y_2 \neq y_1$

and wherein an average of 0.5 to 2.0 nitrogen atoms are quaternized with alkyl radicals containing from 1 to 6 carbon atoms.

4,297,297
α-CYANO-β-(SUBSTITUTED-ANILINO)-N-ETHOXYCARBONYLACRYLAMIDE INTERMEDIATES

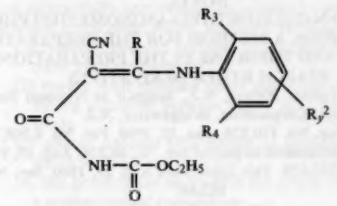
Clive A. Henrick; Jeffrey N. Labovitz, both of Palo Alto, Calif.; Roland T. V. Fox, Crowthorne, England; William G. Rathmell, Wokingham, England, and Margaret C. Shephard, Maidenhead, England, assignors to Zoecon Corp., Palo Alto, Calif. and Imperial Chemical Industries Limited, England

Division of Ser. No. 23,517, Mar. 23, 1979, Pat. No. 4,266,056, which is a continuation-in-part of Ser. No. 894,307, Apr. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,560, Apr. 3, 1978, abandoned. This application Jul. 18, 1980, Ser. No. 170,243

Int. Cl.³ C07C *121/78*

U.S. Cl. 260—465 D **19 Claims**

1. A compound of the following formula (III):



(III)

wherein,

R is hydrogen, methyl or ethyl;

R^2 is lower alkyl, lower alkoxy, bromo, chloro, fluoro, lower haloalkyl, cyano, nitro, lower alkylthio, hydroxy, lower alkylcarbonyl, lower alkoxycarbonyl, lower haloalkoxy, cycloalkyl, clycloalkalkyl, lower haloalkylthio, lower alkenyl or lower alkynyl;

R^3 is hydrogen or independently selected from the values of R^2;

R^4 is hydrogen or independently selected from the values of R^2; and

y is zero, one, two or three, provided that:

(a) when R is hydrogen, R^2 is bromo, and y is one—then either R^3 or R^4 is other than hydrogen and

(b) when R is hydrogen—then either R^3 or R^4 is other than hydrogen or y is one, two or three.

4,297,298
METHOD OF PREPARING STABLE DILUTE SOLUTIONS OF ALIPHATIC CARBOXYLIC PERACIDS, AND THE RESULTING SOLUTIONS

Francois Crommelynck, Saint Martin Le Vinoux; Michel Granger, Chalon-sur-Saone; Michel Rio, Elancourt, and Jacques Tourdot, Paris, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude Procedes Georges Claude, Paris, France

Filed Jul. 22, 1980, Ser. No. 171,047

Claims priority, application France, Aug. 1, 1979, 79 19761

Int. Cl.³ C07C *279/10*

U.S. Cl. 260—502 R **14 Claims**

1. A method of preparing a dilute solution, containing a rated concentration between 1 and 20% by weight, of an aliphatic carboxylic peracid with a stable concentration titer in time, notwithstanding the possible presence of trace amounts of decomposition catalysts, comprising the steps of:

preparing a concentrated solution of aliphatic peracid from the corresponding carboxylic acid or anhydride and hydrogen peroxide in a concentration of between 60 and 90% in the presence of the substantially minimal amount of a strong acid catalyst necessary to obtain equilibrium of the system in a maximum period of 48 hours; and

diluting the concentrated solution of aliphatic peracid, prepared in said preparing step, with a solution containing at least one of the reagents used in said preparing step in an amount and concentration sufficient to bring the concentration of aliphatic peracid at least to the rated concentration of the mixture and such that (a) the maximum concentration of peracid during storage at ambient temperature is at most 10% above the rated concentration of peracid and (b) the concentration after storage for 12 months is at least equal to the rated concentration of aliphatic peracid.

4,297,299
NOVEL N-(ALKYL)-N-(2-HALOETHYL)-AMINOMETHYLPHOSPHONIC ACIDS, A METHOD FOR THE PREPARATION THEREOF AND THEIR USE IN THE PREPARATION OF STARCH ETHER DERIVATIVES

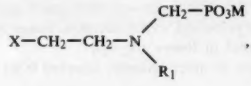
Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 110,926, Jan. 10, 1980, Pat. No. 4,260,738, which is a continuation-in-part of Ser. No. 66,526, Aug. 15, 1979, Pat. No. 4,243,479. This application Aug. 29, 1980, Ser. No. 182,547

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 **3 Claims**

1. As a composition of matter, a compound of the general structure



wherein X is a halogen, M is a cation, and R_1 is a C_1–C_6 group or a C_3–C_6 cycloalkyl group.

4,297,300
NOVEL α-HALOALKYLCARBAMIC ACID HALIDES, AND A PROCESS FOR THE PREPARATION OF α-HALOALKYLCARBAMIC ACID HALIDES

Karl-Heinz Koenig, Frankenthal, and Karl-Heinz Feuerherd, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

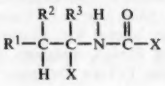
Filed Jun. 25, 1979, Ser. No. 51,744

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830969

Int. Cl.³ C07C *53/50*

U.S. Cl. 260—544 C **1 Claim**

1. An α-haloalkylcarbamic acid halide of the formula



I

where R^1, R^2 and R^3 may be identical or different and each is cycloalkyl of 5 or 6 carbon atoms, R^1 and R^2 together with the adjoining carbon or R^2 and R^3 together with the two adjoining carbons may also be members of a monocyclic or bicyclic alicyclic ring of 5 to 9 carbon atoms, one or two of R^1, R^2 and R^3 may also be hydrogen, and X is halogen.

4,297,301
PROCESS FOR THE MANUFACTURE OF ORGANIC ACID CHLORIDES

Serge L. Lecolier, Janville sur Juine, and Jean-Pierre G. Senet, La Chapelle la Reine, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

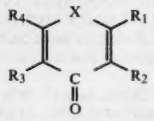
Filed Nov. 23, 1979, Ser. No. 96,657

Claims priority, application France, Nov. 29, 1978, 78 33670; Aug. 30, 1979, 79 21730

Int. Cl.³ C07C *51/60*

U.S. Cl. 260—544 K **15 Claims**

1. Process for the manufacture of a carboxylic acid chloride which consists of phosgenating at a temperature of 90°–150° C., the corresponding acid or acid anhydride in the presence of a catalyst, wherein the catalyst is at least one member selected from the grop consisting of compounds of formula (I)



in which X is oxygen or nitrogen which is monosubstituted by R_5, which is an alkyl containing from 1 to 6 carbon atoms, and in which formula R_1, R_2, R_3 and R_4 are all different, or at least two of them are the same, and are hydrogen or an organic radical which contains at most 20 carbon atoms and wherein the proportion of the catalyst relative to said acid or anhydride, is between 0.01 and 10% by weight.

4,297,302
BUTTERFLY THROTTLE VALVE WITH A RAISED UPPER LIP

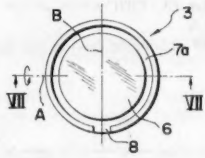
Ken Nakamura, Kawasaki; Hiromichi Ofuji, Yokohama, and Junichi Yokoyama, Ebina, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 3, 1979, Ser. No. 81,432

Claims priority, application Japan, Oct. 7, 1978, 53-137328[U]

Int. Cl.³ F02M *3/08*

U.S. Cl. 261—65 **1 Claim**



1. In an air-fuel mixture supply device for an internal combustion engine having an intake passage into which fuel is supplied: a disk-shaped butterfly throttle valve rotatably mounted on a valve shaft in the intake passage below the position where fuel is supplied thereinto, said throttle valve having an essentially flat upstream face which has an upstream part and a downstream part, a groove formed in said essentially flat upstream face and extending adjacent the entire outer periphery of said throttle valve essentially parallel to said outer periphery of the throttle valve; and

an outlet passage formed on said downstream part of said upstream face and extending from said groove to the outer periphery,

whereby fuel trickling onto the upstream face of said throttle is directed into said groove and guided to the downstream part of said upstream face and discharged to air flow passing through a clearance formed between the inner periphery of said intake passage and the downstream part of said throttle valve to be effectively atomized.

4,297,303
PREPARATION AND REACTION OF ENERGY PRODUCING WASTE MATERIAL COMPOSITION

Paul A. Deardorff, 1128 Dix, Lincoln Park, Mich. 48146; Robert C. Wood, 36002 Huron River Dr., New Boston, Mich. 48164, and Sante M. Cundari, 530 Woodcrest, Dearborn, Mich. 48124

Division of Ser. No. 901,492, May 1, 1978, Pat. No. 4,208,226. This application Jan. 14, 1980, Ser. No. 111,724

Int. Cl.³ C06B *21/00*

U.S. Cl. 264—3 R **16 Claims**

16. A method for preparing a composition for the production of heat comprising the steps of:

(a) mixing an iron-containing waste by-product with a mineral acid, said iron containing waste by-product including an iron oxide,
(b) adding any water required to make the substance pliable,
(c) adding a reducing metal,
(d) then molding the composition and letting it stand.

4,297,304

METHOD FOR SOLIDIFYING AQUEOUS RADIOACTIVE WASTES FOR NON-CONTAMINATING STORAGE

Knut Scheffler, Eggenstein-Leopoldshafen, and Ulrich Riege, Linkenheim-Hochstetten, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe, GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,152
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726087
Int. Cl.³ G21C *21/00*
U.S. Cl. 264—0.5 **24 Claims**

1. Method for solidifying high radioactivity aqueous waste concentrates, medium radioactivity aqueous waste concentrates, actinide containing aqueous waste concentrates, or suspensions of fine-grained solid wastes suspended in water, which concentrates or suspensions contain a metal ion and/or metal oxide, for final noncontaminating storage in which the waste concentrates or the suspensions are subjected together with an absorbing and/or hydraulically binding inorganic material, to a ceramic firing process so as to produce a solid sintered body, comprising the steps of:
(a) treating the waste concentrates or suspensions by evaporation, to form an evaporate, to a water content in the range between 40 and 80 percent by weight and a solid content whose metal ion and/or metal oxide concentration lies between 10 and 30 percent by weight of the evaporate being formed, and adjusting the pH of the evaporate to between 5 and 10;
(b) kneading the evaporate obtained from step (a) with a clay-like substance containing a small quantity of cement or mixture of a clay-like substance with a small quantity of cement containing an additive for suppressing the volatility of alkali metals or alkaline earth metals which may be present in the evaporate and/or an additive for suppressing the volatility of any decomposable anions which may be present in the evaporate selected from the group consisting of sulfate, phosphate, molybdate and uranate ions, at a weight ratio range of evaporate to clay-like substance of 1:1 to 2:1, said clay-like substance being at least one substance selected from the group consisting of pottery clays, stoneware clays, porcelain clay mixtures and kaolins;
(c) producing molded bodies from the kneaded mass obtained from step (b);
(d) heat treating the molded bodies, including drying at temperatures between room temperature and 150° C., calcining at temperatures of about 150° to 800° C., and subsequently firing at temperatures between 800° and 1400° C. to form practically undissolvable mineral phases having a chemical composition corresponding approximately to that of natural, stable minerals or rocks; and
(e) enclosing the molded bodies containing the fired mineral phases on all sides in a dense, continuous ceramic or metallic matrix.

4,297,305

NUCLEAR FUEL RECYCLING SYSTEM

Harvey R. Lee, Omemee; Arnold K. Koch, Etobicoke, and Adam Krawczyk, Mississauga, all of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Jul. 26, 1979, Ser. No. 60,884
Int. Cl.³ G01C *21/00*
U.S. Cl. 264—0.5 **6 Claims**

1. The method of producing nuclear fuel comprising retrieved nuclear fuel material selected from the group comprising substantially uncontaminated grinding swarf, sintered pellets and green pellet forms, including the steps of:
(1) crushing pelleted material to fine powder in a substantially inert atmosphere;
(2) mixing with grinding swarf and liquid to form a slurry having a content between about 70 to 85 weight percent solids;
(3) adding sintered UO_2 pellets as grinding media to the slurry within a wet mill and
(4) wet grinding the slurry with the pellets in the wet mill, to a predetermined consistency.

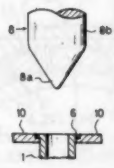
2. The method as claimed in claim 1 including the steps of drying said ground slurry to a powder, and recycling the powder for manufacture to pellet form.

4,297,306

NECK ORIENTING METHOD OF BOTTLES OF SATURATED POLYESTER RESINS

Yataro Yoshino; Sadao Suzuki, and Takuzo Takada, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1979, Ser. No. 92,428
Int. Cl.³ B29C *17/02, 17/07*
U.S. Cl. 264—23 **8 Claims**



1. A method of forming the neck portion of a synthetic resin bottle, the method comprising the steps of:
(a) forming a parison of synthetic resin, the parison having a neck portion and an outwardly projecting lip at the upper outer circumferential end of the neck portion;
(b) heating the neck portion of the parison to an orientable temperature;
(c) holding the parison so that the outwardly projecting lip is retained by a plurality of radially extending arms, said arms being movable back and forth on a horizontal plane;
(d) inserting an orienting rod into the neck portion of the parison, the orienting rod having a converging tapered head and a straight body portion, the straight body portion being of a diameter greater than the diameter of the neck portion prior to insertion of the orienting rod, the neck portion being radially stretched thereby; and
(e) moving the arms radially outwardly as the tapered portion of the orienting rod is inserted into the neck portion of the parison whereby said arms continue to hold the parison as the neck portion thereof is radially stretched.

4,297,307

PROCESS FOR PRODUCING CARBON-CARBON FIBER COMPOSITES SUITABLE FOR USE AS AIRCRAFT BRAKE DISCS

Gordon J. Taylor, Hinckley, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,535
Int. Cl.³ B29C *25/00;* B29D *3/02*
U.S. Cl. 264—29.5 **16 Claims**

1. A process for producing carbon-carbon fiber composites of high strength which comprises forming an aqueous gelled mixture containing between about 5 and 15% by weight chopped carbonaceous fibers and a water-soluble binder-thickening agent selected from the group consisting of polyethylene

oxide, ethyl methyl cellulose, hydroxyethyl cellulose, hydroxyethyl methyl cellulose, hydroxyproply methyl cellulose, methyl cellulose, polyacrylamid, polyvinyl alcohol, polyvinyl methyl ether, starch and gelatin, said binder-thickening agent having a viscosity of at least about 10,000 centipoises at 25° C., extruding the gelled mixture into the form of a continuous elongated ribbon wherein the individual carbon fibers are aligned substantially in the direction of fluid flow, arranging said elongated ribbon in a spiral pattern to form a flat disc shaped article, drying said article to remove water, heating the dried article to a temperature of at least about 300° C. and then impregnating said article with a liquid thermosetting resin binder followed by heating said article under pressure in a mold to a temperature of at least about 1200° C.

4,297,308

METHOD OF MANUFACTURING GAMES RACKETS

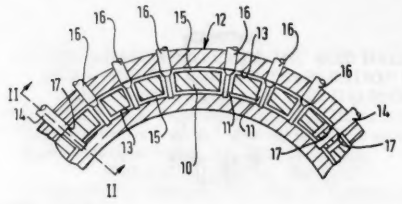
Frank W. Popplewell, Essex, England, assignor to Dunlop Limited, London, England

Filed Feb. 28, 1979, Ser. No. 15,912

Claims priority, application United Kingdom, Mar. 7, 1978, 8925/78

Int. Cl.³ B29C *1/14;* **B29D** *23/02, 27/00*

U.S. Cl. 264—46.6 **7 Claims**



1. A method of making a frame for a games racket, said frame comprising a head and a shaft, in which at least said head is a molding formed by the steps of placing a fusible core material in a mold, said fusible core material containing holes oriented in a radial direction from the center of said mold, placing a plurality of pins in said injection mold, said pins passing centrally through at least some of the holes in said core material, said pins having a smaller diameter than said holes, injecting a thermoplastics material into said mold around said fusible core, said core having a melting point below the injection temperature, the holes of said core causing the injected thermoplastics material to form internal support means between the wall of said molding that is to lie at the outer circumference of said head and that wall of said molding that is to lie at the inner circumference of said head, at least some of said support means being hollow due to the presence of said pins, allowing said molding to set, removing said pins from the core, raising the temperature of said molding to an amount sufficient to melt said core but insufficient to melt or deform said molding, and, removing the molten core from said molding.

4,297,309

PROCESS OF USING AND PRODUCTS FROM FUME AMORPHOUS SILICA PARTICULATES

John W. North, 1520 Farnell Ct., Apt. 533, Decatur, Ga. 30033

Continuation-in-part of Ser. No. 965,233, Dec. 1, 1978, abandoned. This application Jun. 25, 1980, Ser. No. 162,802

Int. Cl.³ C04B *35/14*

U.S. Cl. 264—56 **45 Claims**

1. Process of producing an amorphous silica product comprising:

(a) mixing fume amorphous silica material and water to produce a plastic mixture wherein said silica material consists essentially of stack gas particulate issueing from an electric furace producing silicon metal by the reduction of silica with carbon;

(b) shaping said plastic mixture into a prescribed shape; and

(c) drying the shaped plastic mixture.

4,297,310

PROCESS FOR PRODUCING ELECTRIC CONDUCTORS COATED WITH CROSSLINKED POLYETHYLENE RESIN

Susumu Akutsu; Tsutomu Isaka, and Mitsugu Ishioka, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,126

Claims priority, application Japan, Nov. 13, 1978, 53/139707

Int. Cl.³ B29F *3/10;* **C08G** *77/20*

U.S. Cl. 264—83 **8 Claims**

1. A process for producing electric conductors coated with a crosslinked polyethylene resin which comprises fabricating a coated electric conductor having an extrusion-coated layer of a polyethylene resin comprising a random copolymer on a conductor, the copolymer comprising predominantly units of ethylene monomer and an unsaturated silane monomer represented by the formula $RSiR'_nY_{3-n}$, wherein: R is a member selected from the group consisting of ethylenically unsaturated hydrocarbyl and hydrocarbyloxy groups; R′ is an aliphatic saturated hydrocarbyl group; Y is a hydrolyzable organic group; and n is zero, 1, or 2, and subjecting the coated conductor to a crosslinking process step comprising causing the coated conductor to contact water in the presence of a silanol condensation catalyst, said random copolymer having been produced by the polymerization of said monomers in the presence of a radical initiator under elevated pressure.

4,297,311

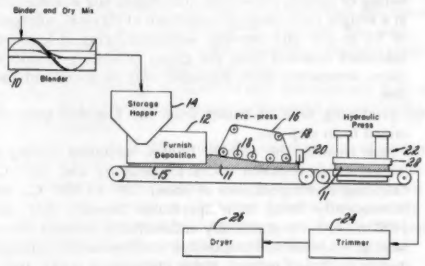
METHOD OF MANUFACTURING IMPROVED MINERAL BOARD

Norman Sherman, Ramsey, and John H. Cameron, St. Paul, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Continuation of Ser. No. 967,217, Dec. 7, 1978, abandoned. This application Oct. 17, 1979, Ser. No. 85,501

Int. Cl.³ B29J *1/00*

U.S. Cl. 264—109 **33 Claims**



1. A method of manufacturing a mineral product comprising the sequential steps of:

(a) forming an admixture comprising perlite and a resin binder therefor, at least 75% by weight of the solids content of said admixture being composed of the perlite/resin binder combination, the perlite being in the expanded form and having an initial average bulk density no greater than about 10 pounds per cubic foot, the said perlite/resin binder combination containing by weight from about 50% to about 95% perlite and from about 5% to about 50% resin binder where the expanded perlite is derived from an active perlite, and the said perlite/resin binder combination containing by weight from about 60% to about 95%

perlite and from about 5% to about 40% resin binder where the expanded perlite is derived from an inactive perlite;

(b) mixing said admixture;

(c) forming a shaped product from said admixture;

(d) subjecting said shaped product to pressure to form it into its final shape, said pressure being sufficient to reduce the bulk volume of the perlite by a crushing factor of at least about;

(i) where the expanded perlite has been derived from an active perlite:

(1) $y=6.5-0.26x$ where x is from about 5 to about 15

(2) $y=3.1-0.035x$ where x is from about 15 to about 50

(ii) where the expanded perlite has been derived from an inactive perlite:

(3) $y=2.3-0.03x$ where x is from about 5 to about 40

wherein in each of formulas (1), (2) and (3): y is the crushing factor and x is the percent by weight of binder in the perlite/resin binder combination; and, thereafter,

(e) curing the resin binder.

4,297,312

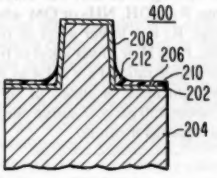
METHOD FOR PREPARING STYLUS LAPPING DISCS

Charles B. Carroll, Trenton, and Howard G. Scheible, Livingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,088

Int. Cl.[3] **B32B** *3/26;* **B29C** *1/02;* **B28B** *19/00*

U.S. Cl. 264—134 **4 Claims**



1. In a method of replicating a groove pattern in the formation of a lapping disc comprising the steps of:

1. recording the pattern in a photoresist layer,
2. developing the photoresist layer to form a photoresist master,
3. transferring the pattern of the photoresist master to a metal matrix master pattern by coating the photoresist master with a metal to form an electroform, and separating the electroform from the photoresist master to produce the said metal matrix master pattern, and
4. replicating the metal matrix master pattern in the surface of a plastic article;

the improvement which comprises the step of forming concave junctions on the metal matrix master by filling in material at the intersections of the walls and base portions of the metal matrix master.

4,297,313

METHOD FOR MANUFACTURING A PACIFIER

Stuart S. Duckstein, 111 Tall Oaks Dr., Wayne, N.J. 07470

Division of Ser. No. 934,673, Aug. 18, 1978, Pat. No. 4,195,638. This application Jul. 30, 1979, Ser. No. 62,114

Int. Cl.[3] **B29C** *6/02*

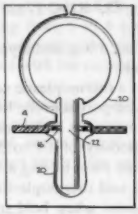
U.S. Cl. 264—273 **2 Claims**

1. A process for making a pacifier comprising the steps of:

(a) forming a rigid shield having a centrally disposed hole and an array of holes concentrically arranged around the centrally disposed hole;

(b) locating the rigid shield member in an injection molding cavity configured in the form of a pacifier which has a ring, nipple, and shield, said shield being located in a section of the cavity between the ring and nipple section with the holes in the shield arranged to provide communication between the ring and nipple sections of the cavity;

(c) locating an interference member within the cavity spaced apart from the edge of the centrally disposed hole in the



rigid shield and extending axially from the rigid shield through the ring section and into the nipple section; and

(d) injecting material from the group comprising thermosetting and thermoplastic material into the cavity to fill the ring and nipple section and to pass through the holes of the shield to retain the shield captive.

4,297,314

METHOD FOR PERMANENT DEFORMATION OF AN ELASTIC MEMBER

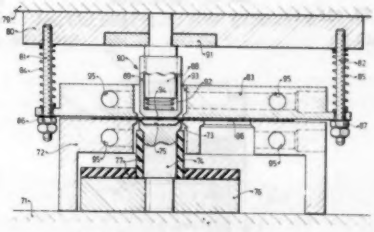
Waldemar Schmidt, Waiblingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 27, 1978, Ser. No. 963,710

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1977, 2753541

Int. Cl.[3] **B29C** *17/03;* **B29D** *23/10;* **B29H** *5/01, 5/16*

U.S. Cl. 264—320 **1 Claim**



1. A method for producing a permanently deformed flexible diaphragm, comprising the steps of:

applying to a permanently deformable flexible diaphragm essentially consisting of a coated rubberized web intended for use as a valve closing member, distending forces to selected parts of a diaphagm which parts are to be displaced out-of-plane thereof to produce a dish-shaped depression in the diaphragm;

applying heat to only said selected parts of the diaphragm which are subjected to the out-of-plane distending forces and while cooling only parts, other than said selected parts, of the diaphragm which are free from distending forces including passing of a cooling medium through channels in a base plate and in a cover plate confining the diaphram therebetween.

4,297,315

METHOD OF MAKING WIG ARCHETYPE

Goro Kasai, Ichikawa; Sanjuro Takechi, and Hiroshi Harima, both of Hasaki, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Dec. 27, 1979, Ser. No. 107,564
Claims priority, application Japan, Dec. 29, 1978, 53/161914
Int. Cl.[3] B29C *17/00*
U.S. Cl. 264—322 8 Claims

1. A method for making a wig archetype to the shape of the human head, comprising:

a. softening a sheet of a thermoplastic composition comprising polyisoprene, said polyisoprene having at least 90% of the isoprene monomer units in the trans-1,4 configuration and an intrinsic viscosity of 1.2 to 3 when measured in toluene at 30° C., said sheet having a thickness from 0.5 to 4.0 millimeters and said thermoplastic composition being sufficiently transparent when held to the head to allow registering of the hair distribution;

b. applying the sheet to the scalp of a human head, shaping said sheet to the shape of said human head and registering the distribution of the hair thereon by marking the location of the hair while said sheet is in contact with said human head;

c. hardening the sheet whereby the thermoplastic composition clearly shows the registered hair density distribution after hardening; and

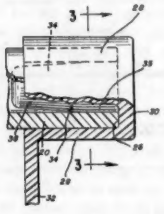
d. removing the sheet from the scalp.

4,297,316

MAINTAINING THE DIMENSIONAL INTEGRITY OF THERMOPLASTIC TUBING ENDS FOR RECEIVING A LUER

Joel Cunningham, Del Mar, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 7, 1980, Ser. No. 110,261
Int. Cl.[3] A61L *2/04*
U.S. Cl. 422—1 3 Claims



1. A method of maintaining the dimensional integrity of an end of thermoplastic tubing having a normal uniform interior diameter which undergoes dimensional distortion at a temperature sufficient to effect heat sterilization treatment thereof, said method comprising the steps of

rigidly supporting with a thermosetting member the interior portion of the tubing end at a diameter which is generally equal to the normal interior diameter thereof,

compressing with a thermosetting member the exterior portion of the tubing end inwardly toward the rigidly supported interior portion thereof, and

exposing the tubing to the temperature sufficient to effect heat sterilization treatment thereof.

4,297,317

LOW LEVEL CHROMATE-BASED CORROSION INHIBITION IN AQUEOUS MEDIUMS

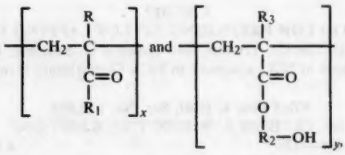
Frederick G. Vogt, deceased, late of Philadelphia, Pa. (by Mary J. Vogt, executrix), and Patricia T. Sparrell, Freehold, N.J., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 28, 1980, Ser. No. 134,812
Int. Cl.[3] C23F *11/12, 11/14, 11/18*
U.S. Cl. 422—16 20 Claims

1. A method for reducing the amount of corrosion of metal surfaces in contact with an aqueous medium comprising adding to said aqueous medium an effective amount for the purpose of a zinc-free and phosphate-free treatment consisting essentially of effective:

(i) water-soluble chromate, and

(ii) water-soluble polymer comprising moieties derived from acrylic acid or water-soluble salt thereof and moieties of hydroxylated lower alkyl acrylate, wherein the moieties of said polymer have the following formulas:



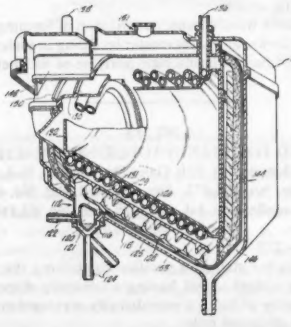
where R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, NH_2 or OM where M is a water-soluble cation; R_2 is a lower alkyl of from about 2 to 6 carbon atoms, R_3 is H or lower alkyl of from 1 to 3 carbon atoms and the mole ratio of x:y is 1:4 to 36:1, wherein said water soluble chromate is added in an amount of from about 0.5 to about 150 parts of active chromate per million parts of said aqueous medium.

4,297,318

BLOOD OXYGENATOR

Donald A. Raible, Santa Ana, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 823,149, Aug. 9, 1977, which is a continuation-in-part of Ser. No. 689,971, May 26, 1976, Pat. No. 4,268,476, which is a continuation-in-part of Ser. No. 584,464, Jun. 6, 1975, abandoned, and a continuation-in-part of Ser. No. 689,971,. This application Jul. 2, 1979, Ser. No. 54,268
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.[3] A61M *1/03*
U.S. Cl. 422—46 18 Claims



1. Apparatus for oxygenating blood comprising: means for combining oxygen-containing gas with liquid blood to form a

mixture of blood and gas, a substantial portion of said mixture being in the form of bubbles; means defining a flow path for the mixture; means in the flow path defining a passageway configured in a manner capable of imparting rotational movement to at least a portion of the bubbles, said passageway having a transverse dimension large enough to permit rotation of the bubbles; and defoaming means downstream of said passageway.

4,297,319

APPARATUS FOR REMOVING NITROGEN OXIDES FROM FLUE GAS

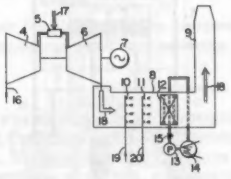
Yoji Ishibashi; Yoshihiro Uchiyama, both of Hitachi; Hidetoshi Akimoto, Tokaimura, and Makoto Sasaki, Morioka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 6, 1978, Ser. No. 967,052

Claims priority, application Japan, Dec. 7, 1977, 52-146021

Int. Cl.³ B01J *8/02;* **F01N** *3/08, 3/28*

U.S. Cl. 422—114 **7 Claims**



1. An apparatus for removing nitrogen oxides from a combustion flue gas, which comprises a flue gas duct for passing a combustion flue gas containing nitrogen oxides therethrough, means for adding ammonia and hydrogen peroxide into the flue gas passing through the flue gas duct, thereby reducing the nitrogen oxides in the flue gas in a gas phase, catalyst means comprised of a metallic oxide system for further reducing the remainder of nitrogen oxides, by directly contacting the flue gas, provided in the flue gas duct downstream of said means for adding ammonia and hydrogen peroxide to the flue gas duct and cooling means for cooling the catalyst means being provided within the catalyst means; the means for adding ammonia and hydrogen peroxide into the flue gas comprising one injector means for the ammonia and another injector means for the hydrogen peroxide.

4,297,320

COATING POLYMERIZATION REACTORS WITH THE REACTION PRODUCTS OF THIODIPHENOLS AND A BLEACH

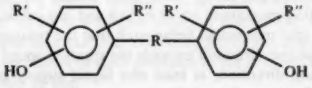
Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 34,106, Apr. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 161,711

Int. Cl.³ B01J *19/00;* **B05D** *7/22;* **C08F** *2/00*

U.S. Cl. 422—131 **16 Claims**

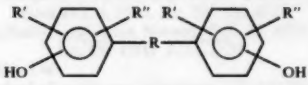
1. A process for substantially eliminating the buildup of polymers on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces an aqueous coating solution having a pH in the range of about 7.5 to about 13.0 and containing the reaction product of a thiodiphenol and and a chlorine containing bleaching agent, said thiodiphenol having the general structure



wherein R is selected from the group consisting of —S—, and

R' is selected from the group consisting of —H, —OH, and an alkyl group containing from 1 to 4 carbon atoms, and R'' is —H or —Cl, and conducting the polymerization of monomer(s) while in contact with the coated internal surfaces of said vessel.

14. A polymerization reaction vessel having on all the internal surfaces thereof a coating comprised of the reaction product of a thiodiphenol and a chlorine containing bleaching agent, said thiodiphenol having the general structure



wherein R is selected from the group consisting of —S—, and

R' is selected from the group consisting of —H, —OH, and an alkyl group containing from 1 to 4 carbon atoms, and R'' is —H, or —Cl, and wherein the coated surfaces are characterized by having a critical surface tension of at least 72 dynes/-centimeter and a contact angle with water of about zero.

4,297,321

APPARATUS HAVING MAIN AND AUXILIARY FLUIDIZED BEDS THEREIN

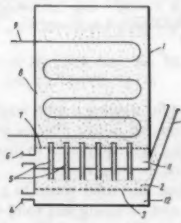
Jaroslav Beranek, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Filed Apr. 8, 1980, Ser. No. 138,323

Claims priority, application Czechoslovakia, Apr. 10, 1979, 2441-79

Int. Cl.³ B01J *8/28, 8/44;* **F27B** *15/08*

U.S. Cl. 422—143 **4 Claims**



1. Apparatus for feeding solid particles at multiple points of a fluidized bed, comprising:

a housing means having a main chamber for formation of a main fluidized bed of solid particles therein,

the bottom of said main chamber comprising a main grid for the distribution of a fluidization fluid to said main fluidized bed;

said housing means having a first space below and communicating with said main grid for receiving a fluidization fluid;

an inlet to said first space for introduction of a fluidization fluid thereto;

said housing means having an auxiliary chamber below said first space for formation of an auxiliary fluidized bed of solid particles therein,

the bottom of said auxiliary chamber comprising an auxiliary grid for the distribution of a fluidization fluid to said auxiliary fluidized bed;

an inlet to said auxiliary chamber for introduction of solid particles thereto;

said housing means having a second space below and communicating with said auxiliary grid for receiving a fluidization fluid;

an inlet to said second space for introduction of a fluidization fluid thereto; and

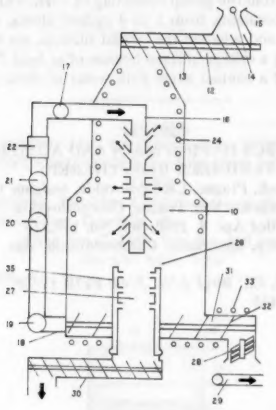
a system of inlet pipes extending between said auxiliary chamber and the lower portion of said main chamber for transporting said solid particles from the auxiliary fluidized bed to the main fluidized bed.

4,297,322

EQUIPMENT FOR TREATING AND RESOURCE RECOVERY FROM SOLID WASTE

Hsin Liu, 40-25 Hampton St., Elmhurst, N.Y. 11373

Division of Ser. No. 827,693, Aug. 25, 1977, Pat. No. 4,204,906.
This application Mar. 11, 1980, Ser. No. 129,609
Int. Cl.³ B01D *9/00, 11/00;* **B01F** *9/08, 15/02*
U.S. Cl. 422—184 **18 Claims**



1. An equipment for treating a solid waste containing fibrous combustible matters and fusible plastics comprising:

means for heating said equipment to provide therein a vertically elongated, heating zone;

means for feeding said solid waste to a top portion of said heating zone and dropping said solid waste into said heating zone, said solid waste falling freely under gravity inside said zone;

during the free gravitational fall through said heating zone said solid waste being heated to a treatment temperature sufficiently high to fuse said fusible plastics and also to exceed the combustion temperature of said fibrous combustion matters in air;

means for establishing in said heating zone a gaseous atmosphere which will not support combustion of said fibrous combustible matters at said treatment temperature; and

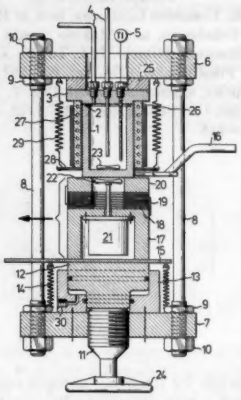
means for providing a separating force having at least a horizontal component to separate said falling and fusing plastics from said falling fibrous combustible matters.

4,297,323

PRESSURE VESSEL HAVING QUICK-ACTION LOCKING MEANS

Karl-Heinz Tetzlaff, Kelkheim; Wilhelm Riemenschneider, Frankfurt am Main, and Günter Leuschner, Schwalbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 27, 1980, Ser. No. 181,807
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934789
Int. Cl.³ B01J *3/03, 3/04*
U.S. Cl. 422—208 **9 Claims**



1. A pressure vessel having quick-action locking means therefor which comprises a holder to which the top of the pressure vessel containing connections and/or measuring equipment is rigidly mounted, a presser, and a sliding spacer device positioned between the detachable lower part of the pressure vessel and the presser; the top of the pressure vessel and the lower part thereof positioned on the spacer device being tightly compressed by the presser.

4,297,324

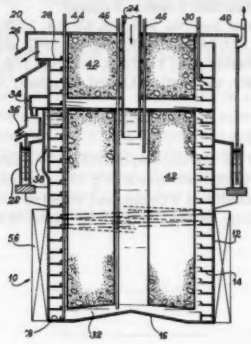
APPARATUS FOR THE CONTINUOUS PROCESSING OF COMPOUNDS IN A LIQUID

Henri Sauvage, and Maurice Tarnero, both of Bagnols sur Ceze, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 24, 1980, Ser. No. 209,601
Claims priority, application France, Dec. 18, 1979, 79 30951
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—268 **10 Claims**

1. An apparatus for processing compounds in a liquid, wherein it is constituted by a helical vibrating elevator having a cylindrical tank with a vertical axis, a fixed cover, an annular helical ramp fixed to the tank wall, means for imparting a reciprocating movement about its axis and in a vertical plane to the ramp, said movement being such that the rotation speed of the ramp in one direction exceeds the rotation speed thereof in the opposite direction, at least one liquid supply pipe in the cover, at least one lateral discharge opening for the liquid in

the tank, a supply chute for supplying the compounds carried by the cover and whose axis coincides with that of the tank and



a discharge chute for discharging the compounds located at the top of the helical ramp and in an extension of the latter.

4,297,325

METHOD OF PRODUCING PSEUDOBOEHMITE FROM ALUMINUM SALT SOLUTIONS

Julius Scherzer, Anaheim; Anh-Thu Liu, Santa Ana, and Yih-Yau Sun, Montebello, all of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Filed Dec. 8, 1980, Ser. No. 214,215
Int. Cl.³ C01F 7/34
U.S. Cl. 423—122 **7 Claims**

1. A method for producing pseudoboehmite from aluminum sulfate solutions containing Fe^{+++}, and alkaline earth ions which comprises adding a reducing agent and reducing Fe^{+++} to Fe^{++} without precipitating compounds of the Fe, or alkaline earth ions and then adjusting the pH in the range of about 4 to about 5 to form alumina hydrate gel without precipitating any substantial quantities of Fe or alkaline earth compounds, separating the gel from the leach solution aging the gel at a pH in excess of about 9 and forming pseudoboehmite substantially free of Fe and of alkaline earth cations.

4,297,326

METHOD OF PRODUCING A PURE ALUMINIUMOXIDE FROM SOLUTIONS CONTAINING DISSOLVED IONS OF ALUMINIUM AND IRON

Norvald Gjelsvik, Oslo, and Ingleif Hundere, Frogner, both of Norway, assignors to Elkem-Spigerverket a/s, Oslo, Norway

Filed Feb. 4, 1980, Ser. No. 118,601
Claims priority, application Norway, Feb. 13, 1979, 790460
Int. Cl.³ C01F 7/22
U.S. Cl. 423—126 **1 Claim**

1. A method of continuously producing hexahydrated aluminium chloride which on calcining forms an aluminium oxide with a ferric oxide content of less than 0.05% from an ore containing aluminium and iron constituents comprising:

(a) treating a first quantity of said ore with sulfuric or hydrochloric acid or a mixture thereof to form a solution comprising aluminium and iron ions;

(b) treating the solution of step (a) with hydrochloric acid gas to form a precipitate of hexahydrated aluminium chloride and to form a mother liquor containing iron ions;

(c) treating a further quantity of said ore with said mother liquor to form a further solution comprising aluminium and iron ions, the iron ions being present in approximately the cumulative of their presence in the first and the further quantity of ore;

(d) treating said further solution with hydrochloric acid gas to form a precipitate of hexahydrated aluminium chloride and to form a mother liquor containing iron ions;

(e) continuing the treatment of further quantities of said ore in the manner of steps (c) and (d) and and with the amount of iron ions in said mother liquor being between 8 and 28 grams per liter; and

(f) calcining the hexahydrated aluminium chloride to aluminium oxide with a ferric oxide content of less than 0.05%.

4,297,327

METHOD OF PRECIPITATION OF PURE ALUMINIUMCHLORIDE FROM SOLUTIONS WHICH CONTAIN IONS OF ALUMINIUM AND MAGNESIUM

Norvald Gjelsvik, Oslo; Gunnar Hannestad, Skedsmo; Ingleif Hundere, Frogner, and Jan H. Torgersen, Skjetten, all of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Filed Feb. 4, 1980, Ser. No. 118,602
Claims priority, application Norway, Feb. 13, 1979, 790458
Int. Cl.³ C01F 7/22, 7/30
U.S. Cl. 423—126 **4 Claims**

1. A method of producing aluminium chloride hexahydrate with a low content of magnesium from hydrochloric acid solutions containing aluminium and magnesium comprising:

(a) in a first step treating said solution with hydrochloric acid gas whereby aluminium chloride hexahydrate crystals are precipitated while the mother liquor solution maintains a ratio between aluminium and magnesium at a ratio above 0.5 for grams of Al^{+3}: grams of Mg^{+2}; and

(b) separating the precipitated aluminium chloride hexahydrate crystals from the mother liquor;

(c) in at least one second step transferring said mother liquor solution to a separate container, adding additional hydrochloric acid gas, and continuing to maintaining the ratio between said Al^{+3} and said Mg^{+2} above said 0.5 ratio, while continuing to precipitate further aluminium chloride hexahydrate crystals;

(d) separating the further precipitated aluminium chloride hexahydrate crystals from the mother liquor; and

(e) in a subsequent step precipitating substantially all remaining aluminium as aluminium chloride with additional hydrochloric acid gas and returning the precipitated aluminium chloride to solution and renewed precipitation.

4,297,328

THREE-WAY CATALYTIC PROCESS FOR GASEOUS STREAMS

James S. Ritscher, Ossining, and Michael R. Sandner, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 80,132
Int. Cl.³ B01D 53/36
U.S. Cl. 423—213.2 **12 Claims**

1. A process for the concurrent catalytic reduction of oxides of nitrogen and the oxidation of carbon monoxide and hydrocarbons contained in a gas stream wherein said process consists essentially of contacting the gas stream with a high-silica zeolite containing copper metal or ions, said zeolite having a silica to alumina ratio of at least 20, and wherein said gas stream contains a stoichiometric excess of oxidant.

4,297,329

VAPOR-LIQUID CONTACTING SYSTEM

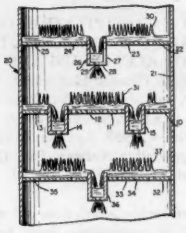
Paul W. Sigmund, Tarrytown, and Kenneth F. Butwell, Newburgh, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 863,350, Dec. 22, 1977, abandoned. This application May 14, 1980, Ser. No. 149,733
Int. Cl.³ B01D 53/34
U.S. Cl. 423—228 **3 Claims**

1. In a process for absorbing hydrogen sulfide from a gas mixture containing hydrogen sulfide and carbon dioxide by an

amine liquid solvent in an absorption zone containing a plurality of generally horizontally aligned, vertically spaced-apart perforated trays on which liquid solvent, flowing generally downwardly through the absorption zone from tray to tray, is contacted with upwardly flowing gas mixture, the improvement comprising:

(a) providing an open area of from 3 to 5% on each of said trays, formed by fixed size perforation openings of from 1/16 to 3/32 inch diameter;



(b) flowing said gas mixture through said open area perforation openings at a velocity of from 50 to 133 ft/sec; and

(c) maintaining the liquid height of said amine solvent on said trays in the range of from $\frac{1}{4}$ to $\frac{3}{4}$ inch, whereby upwardly directed laminar jetting of liquid is obtained over said tray perforation openings for solvent-gas mixture contacting and selective hydrogen sulfide absorption.

4,297,330

PROCESS OF SELECTIVELY DESULFURIZING GASES

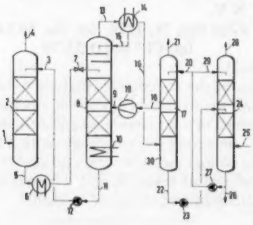
Johann Schlauer, Frankfurt am Main; Georg Kempf, Schöneck, and Alexander Doerges, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,360

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2912115

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—232 **7 Claims**



1. A process for selectively desulfurizing gases which contain hydrogen sulfide and carbon dioxide which comprises scrubbing said gases with an aqueous potassium carbonate solution under a superatmospheric pressure at a temperature of about 100° C., said aqueous potassium carbonate solution having a mass ratio of 1.0 to 3.0 vals (gram equivalent) of alkali in the solution per mole of CO_2 and H_2S in the gases to be purified, regenerating the laden scrubbing solution by stripping the same with a gas in which the CO_2 partial pressure is above 0.2 bar and recycling the so regenerating scrubbing solution.

4,297,331

CATALYSIS

Paul A. Sermon, Cowley, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 948,508, Oct. 4, 1978, which is a continuation of Ser. No. 826,831, Aug. 22, 1977, abandoned. This application Jun. 11, 1980, Ser. No. 158,492

Claims priority, application United Kingdom, Aug. 24, 1976, 35202/76

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—239 **7 Claims**

1. A method for the decomposition of NO present in a gas stream which comprises contacting the gas with a catalyst consisting essentially of a compound selected from the group consisting of TiB_2, ZrB_2, MoB, WB, Ta_2N, BN, $MoSi_2$ and WSi_2.

4,297,332

METHOD FOR TREATMENT OF A DISCHARGE LIQUID PRODUCED IN TREATMENT OF AN EXHAUST GAS

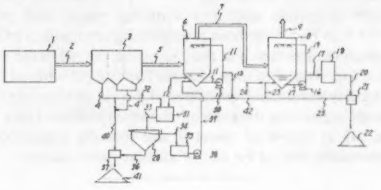
Atsushi Tatani, Hiroshima, and Susumu Okino, Yamaguchi, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1980, Ser. No. 112,444

Claims priority, application Japan, Jan. 18, 1979, 54-4132

Int. Cl.³ C01B *7/00*

U.S. Cl. 423—240 **6 Claims**



4. In a method for treatment of an exhaust gas which comprises the steps of treating an exhaust gas discharged from a coal combustion apparatus in a dry type dust collecting device to remove fly ash from said exhaust gas, treating the resultant exhaust gas from said dry type dust collecting device in an absorption tower where halogen gas and SO_2 in said exhaust gas are absorbed to produce a slurry containing calcium sulfite, oxidizing said slurry containing calcium sulfite into a gypsum slurry, and separating said gypsum slurry into solid and liquid to recover gypsum and at the same time to obtain filtrate separated from said gypsum, the improvement wherein:

(1) said dry type dust collecting device is divided into at least two sections along the direction of gas flow to separate the collected fly ash into at least two parts, one part being fly ash collected on the most upstream side of said gas flow, and a second part being fly ash collected on the downstream side of said gas flow;

(2) said filtrate separated from said gypsum is mixed with a part of said fly ash collected at said most upstream side of said gas flow in said dry type dust collecting device to form a mixed slurry; and

(3) said mixed slurry is separated into clear water and sludge, said clear water is supplied to said absorption tower, and said sludge is mixed with a part of said fly ash collected in said dry type dust collecting device.

4,297,333

METHOD OF DECOMPOSING HYPOCHLORITE ION IN A BASIC SOLUTION

Roger A. Crawford, Wadsworth, and Robert B. Simmons, Norton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 7, 1980, Ser. No. 166,020
Int. Cl.³ B01D *53/34;* C01D *3/08;* C01B *13/02;* C02F *1/72*
U.S. Cl. 423—241 24 Claims

18. In a method of removing chlorine from a gas stream comprising scrubbing the gas stream with an aqueous alkaline solution, and thereafter contacting the resulting solution with a solid hypochlorite decomposition catalyst, whereby to form oxygen molecules and chloride ion, the improvement wherein said hypochlorite decomposition catalyst is a solid comprising nickel (II) oxide and bimetal $NiCo_2O_4$ spinel.

4,297,334

PROCESS FOR REMOVING COLOR BODIES FROM BROWN PHOSPHORIC ACID

Thomas A. McConomy, Coraopolis, and Bruce D. Wells, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 93,347, Nov. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 13,495, Feb. 21, 1979, abandoned. This application Aug. 4, 1980, Ser. No. 174,979
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—321 R 2 Claims

1. In a process for purifying brown phosphoric acid by means of filtration through activated carbon and recovering the phosphoric acid wherein the improvement consists of filtering the brown phosphoric acid through a bed of activated carbon having a total pore volume of 1.0 cc/g or greater with about half of the total pore volume located in pores 35 Å or less in radius.

4,297,335

ALUMINUM DEFICIENT ZEOLITE COMPOSITIONS AND PROCESS FOR PREPARING SAME

Brent M. T. Lok, New City, N.Y., and Thomas J. P. Izod, Holliston, Mass., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 25, 1980, Ser. No. 133,848
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—328 10 Claims

1. Process for enhancing the hydrophobicity of crystalline zeolites which comprises;

(a) providing an activated crystalline zeolitic aluminosilicate having a SiO_2/Al_2O_3 molar ratio of at least 2, and having at least 60 percent, of the framework aluminum atoms not associated with metal cations;

(b) contacting said activated aluminosilicate with a gas mixture comprising

(i) from 0.1 to 20 volume percent fluorine

(ii) from zero to 21 volume percent oxygen

(iii) and as the remainder, one or a mixture of two or more inert gases,

said contact being at a temperature of from about 50° F. to 400° F. for a period of at least 1 minute.

4,297,336

PREPARATION OF SOLUTIONS OF BASIC ALUMINIUM NITRATE

Robert S. Marsden, Kelsall, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 19, 1980, Ser. No. 160,841
Claims priority, application United Kingdom, Jun. 26, 1979, 22209/79
Int. Cl.³ C01F *7/66*
U.S. Cl. 423—395 21 Claims

1. A process for the preparation of a stable, liquid aqueous solution of basic aluminium nitrate which comprises:

(i) reacting an aluminium oxide with nitric acid solution at a temperature of below 25° C. to form aluminium hydroxide,

(ii) separating the resulting aluminium hydroxide precipitate,

(iii) if necessary removing alkali metal ions and other undesirable ions from the precipitate, and

(iv) digesting the aluminium hydroxide precipitate in nitric acid or aluminium nitrate.

4,297,337

SOLID-PHASE IMMUNOASSAYS USING MAGNETIC GLASS

Gerald R. Mansfield, Painted Post; Karen L. Travis, Corning, and William P. Vann, Beaver Dams, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 13, 1979, Ser. No. 29,576
Int. Cl.³ G01N *33/48;* G01T *1/00*
U.S. Cl. 424—1 34 Claims

1. In a process for carrying out a solid-phase immunoassay wherein a biological material is complexed with a water-insoluble, inert particulate carrier and, during the assay, the particulate carrier is separated from a fluid, the improvement which comprises utilizing, as said particulate carrier, water-insoluble, inert, magnetically-dilute particles of a glass and/or crystal-containing material having iron-containing, magnetic crystals incorporated therein with dimensions of less than about 1000 Å which are essentially enveloped within the glass and/or crystal structure, and magnetically separating said particulate carrier from said fluid.

4,297,338

MALIGNANT TUMOR IMMUNITY LEVEL DETECTION

Jack G. Makari, 88 Everett Rd., Demarest, N.J. 07627

Continuation-in-part of Ser. No. 14,827, Feb. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,258, Jun. 29, 1978, abandoned, which is a continuation of Ser. No. 679,926, Apr. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 342,097, Mar. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 37,406, May 11, 1970, abandoned, which is a continuation of Ser. No. 421,683, Dec. 28, 1964, abandoned, which is a continuation-in-part of Ser. No. 75,454, Aug. 26, 1959, abandoned, and a continuation-in-part of Ser. No. 31,855, May 1, 1970, abandoned, which is a continuation of Ser. No. 530,774, Mar. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 127,849, Jul. 31, 1961, abandoned, which is a continuation-in-part of Ser. No. 75,454, Aug. 26, 1959, abandoned, and a continuation-in-part of Ser. No. 159,473, Jul. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 535,364, Mar. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 421,683, Dec. 28, 1964, abandoned. This application Sep. 12, 1980, Ser. No. 186,781
Int. Cl.³ A61K *49/00, 39/00*
U.S. Cl. 424—9 6 Claims

1. The method of detecting the level of immunity to the development of a malignant tumor in a human subject, which method comprises the combination of steps of

(a) intradermally injecting into the subject to be tested a level of immunity to malignant tumor development detecting effective dosage of a diagnostic isotonic aqueous

sodium or potassium chloride solution containing essentially a glycoprotein-polysaccharide-like antigenic substance derived from malignant tumor tissue and which readily disperses in cold to boiling water and in aqueous sodium or potassium chloride solutions to a stable, non-dialyzable solution, is stable to boiling in water and in aqueous sodium or potassium chloride solutions, is non-dialyzable at a cutoff point of 3500 from water, inert to alkali and to phosphate buffered isotonic aqueous sodium or potassium chloride solutions, precipitated from aqueous media by isopropanol and insoluble in it, ether, chloroform, and butanol, withstands autoclaving at 250° F. and 16 lbs. per square inch pressure for at least 30 minutes and retains its activity after autoclaving even up to 6 hours, gives a positive Molisch test and a negative Dische test, and on acid hydrolysis as by heating it in a 2 N aqueous solution of trifluoroacetic acid or in contact with the acid form of polystyrene nuclear-sulfonic acid cation exchange resin, in a sealed tube in a boiling water bath for 24 hours, yields a hydrolysate containing identifiable sugars and on finite analysis shows also trace amounts of various amino acids typical of N-glycoprotein; and which glycoprotein-polysaccharide-like antigenic substance when dispersed in an isotonic aqueous sodium or potassium chloride solution in an amount for it to contain about 0.25 micrograms of said antigenic substance per milliliter and thereafter one-tenth milliliter of the resulting solution is injected intradermally into a human subject to be tested, produces an erythema about the injection site;

(b) measuring separately the two longest diameters perpendicular to one another of the resulting injection-produced bleb and any erythema encircling it, and

(c) calculating the mean of those two diameters and from the magnitude of the mean determining the level of immunity from a scale, on which a mean of 10 mm. or less indicates no immunity and a mean of at least from over 10 to 15 mm. indicates minimum immunity and a mean of 30 to 50 mm. or more indicates best immunity.

4,297,339

CONTROLLED RELEASE CYCLOHEXIMIDE COMPOSITIONS

Richard L. Craven, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 49,823, Jun. 18, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,732

Int. Cl.³ A01N *25/26, 25/34, 43/40*

U.S. Cl. 424—19 **6 Claims**

1. A composition useful for the controlled release of cycleheximide, which consisting essentially of a hardened, substantially uniform mixture of:

(a) from about 0.03 to 30 percent, by weight, of cycloheximide;

(b) from about 0.01 to 25 percent, by weight, of an emulsifier having an HLB number within the range of from about 5 and 18; and

(c) from about 45 to 99 percent, by weight, of an oxidized wax which contains about 5 to about 17 pounds of oxygen per 100 pounds of wax, prepared by adding the cycloheximide

(a) and emulsifier,

(b) to the melted wax,

(c) making a homogeneous mixture thhereof, and then cooling the resulting mixture to a solid form.

4,297,340

COSMETIC COMPOSITION FOR SKIN AND HAIR TREATMENT

Yoshiaki Abe, Tokyo; Shigeo Inoue, Ichikai, and Atsuo Ishida, Chiba, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

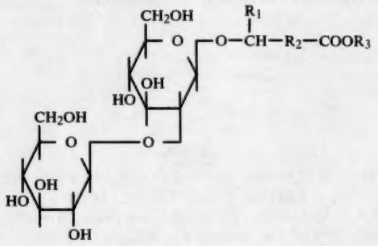
Filed Sep. 13, 1979, Ser. No. 75,009

Claims priority, application Japan, Sep. 26, 1978, 53/118413

Int. Cl.³ A61K *7/06, 7/08, 7/025, 7/027*

U.S. Cl. 424—70 **3 Claims**

1. In a cosmetic composition for the treatment of skin and hair, the improvement comprising the addition, as a moisturizer, of from 0.1 to 50% by weight of the composition of a glycolipid ester represented by the formula,



wherein R_1 represents a methyl group or a hydrogen atom; R_2 represents a saturated or unsaturated hydrocarbon group having 11 to 15 carbon atoms when R_1 is a methyl group, or a saturated or unsaturated hydrocarbon group having 12 to 16 carbon atoms when R_1 is a hydrogen atom; and R_3 represents a saturated or unsaturated hydrocarbon group having 1 to 20 carbon atoms.

4,297,341

SPERMICIDAL COMPOSITION

Donald P. Waller, Elmhurst; Lourens J. D. Zaneveld, Forest Park, and Harry H. S. Fong, Glen Ellyn, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed May 9, 1980, Ser. No. 148,567

Int. Cl.³ A61K *31/11, 31/79*

U.S. Cl. 424—80 **4 Claims**

1. A spermicidal composition for vaginal application comprising the complex formed from about 90 to about 50% by weight of polyvinylpyrrolidone and from about 10 to about 50% by weight of gossypol.

4,297,342

3-PYRIDYLMETHYLTHIOCARBAMATES

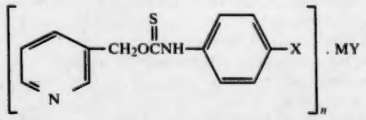
Edward E. Kilbourn, Chalfont; Ernest D. Weiler, Ambler, and William D. Weir, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 8,296, Jan. 31, 1979, Pat. No. 4,233,289, which is a division of Ser. No. 591,581, Jun. 30, 1975, Pat. No. 4,156,780. This application Jan. 17, 1980, Ser. No. 114,026

Int. Cl.³ C07D *213/59;* **A61K** *31/44*

U.S. Cl. 424—84 **14 Claims**

1. A metal salt complex of the formula



wherein

X is cyano, nitro, mercapto, (C_1–C_6)alkylthio, (C_1–C_6)alkylsulfinyl, (C_1–C_6)alkylsulfonyl or (C_1–C_6)alkylsulfamyl;

M is calcium, copper, manganese, nickel or zinc;

Y is an anion which satisfies the valence of the cation M which is selected from the group consisting of bromide, chloride, nitrate, sulfate or oxalate;

n is the integer one.

2. A rodenticidal composition which comprises a carrier and as the active ingredient a rodenticidally effective amount of a complex according to claim 1.

4,297,343
CONTRACEPTIVE AGENT

Hans Bohn, and Ernst Wellmann, both of Marburg an der Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 949,633, Oct. 10, 1978, abandoned. This application May 16, 1980, Ser. No. 150,572

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 2745680

Int. Cl.[3] **A61K** *39/00;* **C07G** *7/00;* **A61K** *37/00*

U.S. Cl. 424—85 **2 Claims**

1. A method for the passive immunization of a pregnant female primate to induce abortion, which method comprises parenterally administering to said primate an amount, effective for inducing abortion, of antibodies against the placenta-specific glycoprotein PP_5.

4,297,344
BLOOD COAGULATION FACTORS AND PROCESS FOR THEIR MANUFACTURE

Horst Schwinn; Norbert Heimburger, both of Marburg an der Lahn; Gerhardt Kumpe, Wetter, and Bernd Herchenhan, Kirchhain, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Apr. 23, 1980, Ser. No. 142,962

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916711

Int. Cl.[3] **A61K** *35/14, 31/00, 37/00*

U.S. Cl. 424—101 **4 Claims**

1. A method for stabilizing against heat an aqueous solution containing at least one member selected from the group consisting of coagulation factors II, VIII, XIII, antithrombin III, and plasminogen, which method comprises adding to said solution from 1.0 to 3.0 mols per liter of at least one amino acid selected from the group consisting of glycine, α- and β-alanine, hydroxyproline, glutamine, and α-, β-, and γ-aminobutyric acid and from 20 to 60 w/w percent of a carbohydrate selected from the group consisting of monosaccharides, oligosaccharides, and sugar alcohols.

4,297,345
ANTIBACTERIAL AGENTS

Thomas T. Howarth, Ewhurst, England, assignor to Beecham Group Limited, England

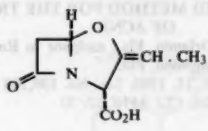
Division of Ser. No. 857,112, Dec. 5, 1977, which is a division of Ser. No. 669,697, Mar. 23, 1976. This application Oct. 22, 1979, Ser. No. 87,030

Claims priority, application United Kingdom, Apr. 14, 1975, 15209/75; Sep. 27, 1975, 39663/75

Int. Cl.[3] **A61K** *35/00*

U.S. Cl. 424—114 **17 Claims**

10. A method of treating bacterial infection in humans and animals which comprises administering to humans or animals in need thereof synergistically effective amount of a compound of the formula (III):



(III)

or a pharmaceutically acceptable salt thereof, and an antibacterially effective amount of benzylpenicillin or the acetoxymethyl ester thereof, the weight ratio of said compound or pharmaceutically acceptable salt thereof and said benzylpenicillin or ester thereof being 20:1 to 1:5.

4,297,346
PSEUDOPEPTIDES USED AS MEDICAMENTS

Richard Rips, and Elisabeth Morier, both of Paris, France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Continuation of Ser. No. 14,314, Feb. 23, 1979, abandoned, which is a continuation of Ser. No. 858,479, Dec. 8, 1977, abandoned. This application Dec. 7, 1979, Ser. No. 101,555

Claims priority, application United Kingdom, Dec. 10, 1976, 51632/76

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 424—177 **15 Claims**

1. Pseudopeptide formed by at least one peptide radical originated from a neuropeptide by removal of one of more of the terminal sequences, connected by a peptide bond to a molecule or to a derivative of a therapeutically active molecule acting on the central nervous system, said neuropeptide being selected from the group consisting of endorphine and neuropeptides having from 2 to 11 amino acid sequences and said therapeutically active molecular being selected from the group consisting of amphetamine (Amph), 4-nitro-amphetamine (Amph-NO_2), 4-amino-amphetamine (Amph-NH_2), 4-chloroamphetamine (Amph-Cl), N-phthaloyl-4-amino-amphetamine, 3,4-dibenzoxyphenyl ethylamine, phenyl ethylamine (PEA), dopamine, 5-(3-aminopropyliden dibenzo-(a,d)-cycloheptadi-1,4-ene (PDD), 1,3-dihydroxy-7-amino 5-phenyl-1H-benzodiazepine-(1,4)-one-(2) (BD), 20-(3-aminopropyl) 3-phenothiazine (PP), 1,5-dimethyl-2-phenyl-4-amino-3-pyrazolone (AP), 4-ethoxyaniline (PT), 4-phenyl-4-ethoxycarbonyl piperidine (NP), tryptamine (Try-NH_2) and 4-amino-barbituric acid (AB).

7. As a novel medicament for asthenia, an effective amount of a pseudopeptide of the class consisting of pGlu-His-Amph and Pro-Leu-Amph together with a pharmaceutically acceptable carrier therefor.

4,297,347
NUCLEOSIDE DERIVATIVES AND AN ANTILEUKEMIAL AGENT CONTAINING THE SAME AS AN ACTIVE INGREDIENT

Nobuhiko Katsunuma, No. 1-78, Shomachi, Tokushima-shi, Tokushima-ken, Japan

Filed Oct. 31, 1979, Ser. No. 89,887

Claims priority, application Japan, Oct. 31, 1978, 53-134708; Jan. 11, 1979, 54-2564; Jan. 11, 1979, 54-2565

Int. Cl.[3] **A61K** *31/70;* **C07H** *19/20, 19/10*

U.S. Cl. 424—180 **8 Claims**

1. A compound selected from the group consisting of guanosine-3'-diphosphate, guanosine-3'-triphosphate, uridine-3'-diphosphate, uridine-3'-triphosphate, cytidine-3'-diphosphate, cytidine-3'-triphosphate, and a pharmaceutically acceptable salt thereof.

8. An agent effective against L5178Y lymphatic leukemia in mice containing a pharmaceutically acceptable carrier and a pharmaceutically acceptable amount of a compound in accordance with claim 1.

4,297,348

COMPOSITION AND METHOD FOR THE TREATMENT OF ACNE

Stephen E. Frazier, Orlando, Fla., assignor to Rush-Hampton Industries, Inc., Longwood, Fla.

Filed Apr. 11, 1980, Ser. No. 139,208
Int. Cl.³ A61K *31/70*
U.S. Cl. 424—180 **8 Claims**

1. A therapeutic composition for the treatment of acne comprising:

a. from about 0.1% to about 5% by weight naringin;
b. from about 0.1% to about 10% by weight naringenin;
c. from about 0.05% to about 5% by weight of an antimicrobially active partially hydrolyzed naringin; and
d. from about 80% to about 98% by weight of a suitable solvent.

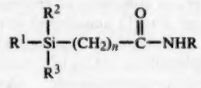
4,297,349

SILICON-BEARING CARBOXYLIC ACIDS AND AMIDES

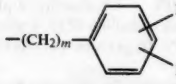
Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Apr. 15, 1980, Ser. No. 140,562
Int. Cl.³ A01N *55/00*; C07F *7/10*
U.S. Cl. 424—184 **22 Claims**

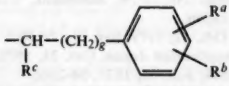
1. A compound of the formula:



wherein n is a whole integer of from 3 to 20, each of R^1, R^2 and R^3 is, independently, either (a) alkyl having from 1 to 22 carbon atoms; or (b) a radical of the formula



in which m is 0, 1 or 2, and each of R′ and R″ is, independently, a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127; provided that the sum of n and the number of carbon atoms in any one of R^1, R^2 or R^3 is not greater than 34 when any of R^1, R^2 or R^3 is of type (a); and R is of type (a) an aralkyl-type radical of the structure:



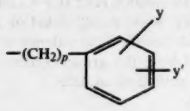
(a)

wherein g is 0, 1 or 2;

R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

R^b is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

R^c is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



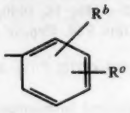
(ii)

in which p is 0, 1 or 2, and

y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or

subtype (iii) alkyl having from 1 to 8 carbon atoms; or R is of type (b) a phenyl-type radical of the structure

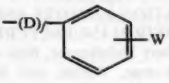


(b)

in which R^b is as defined above, and

R^o is a hydrogen atom, halo having an atomic weight of from about 19 to 127, ie. alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or

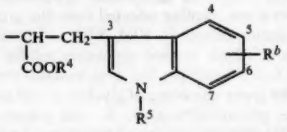
R^o is a radical of the structure R^f:



in which D is —CH_2— or —O—;

f is 0 or 1; and

W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or R is of type (c) an indolyl radical of the structure:



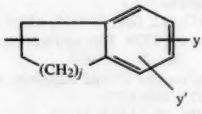
(c)

wherein R^b is as defined above;

R^4 is alkyl having from 1 to 8 carbon atoms or benzyl (unsubstituted); and

R^5 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl (unsubstituted); or

R is (d) a benzocycloalkyl radical of the structure:



(d)

wherein y and y′ are as defined above; and

j is a whole integer of from 1 to 4.

14. A pharmaceutical composition suitable for reducing the cholesterol ester content of an arterial wall of a mammal comprising a cholesterol ester-reducing effective amount of a com-

pound of claim 1 and a non-toxic pharmaceutically-acceptable carrier.

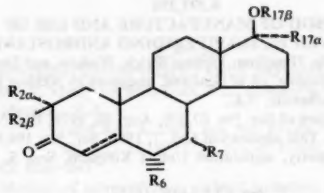
4,297,350

MALE CONTRACEPTIVE STEROIDS AND METHODS OF USE

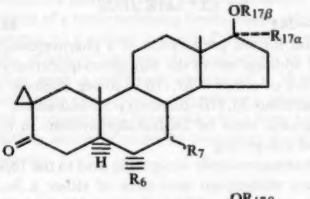
John C. Babcock; J. Allan Campbell, both of Kalamazoo, and Thomas J. Lobl, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 10, 1978, Ser. No. 949,797
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—238 **17 Claims**

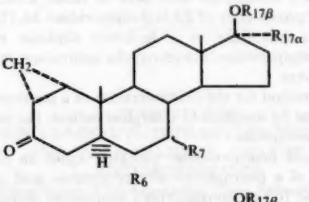
1. A method of effecting male contraception which comprises oral administration of a contraceptively effective amount of a comound of the formula:



I



II



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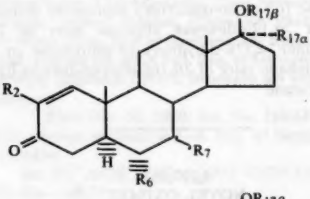

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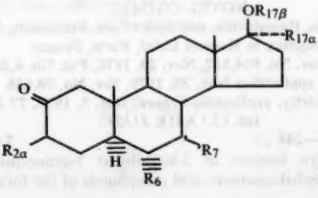

V

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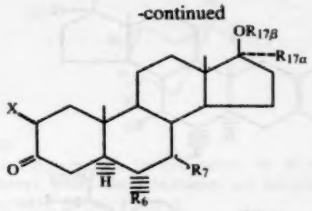
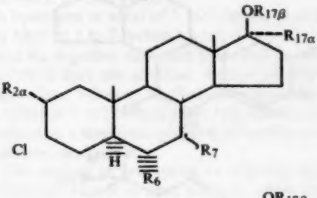
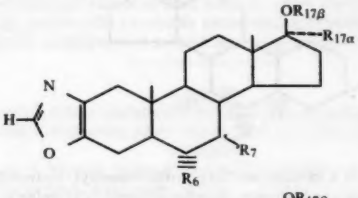


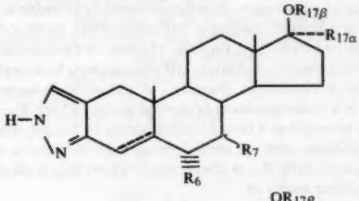
VI



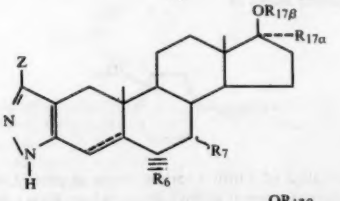
VII



VIII



IX



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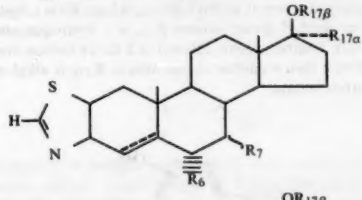
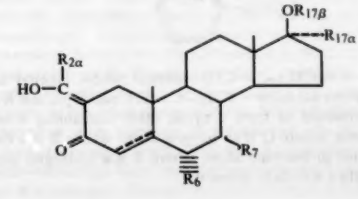


XI



XII

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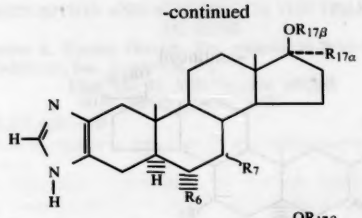
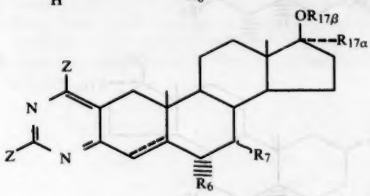
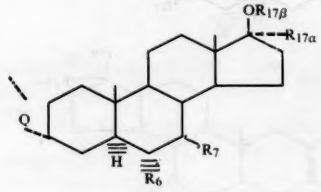


XIII

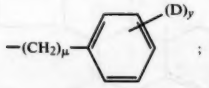


XIV



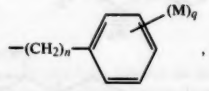
XV

where A is a methyl, methoxy, trifluoromethyl, hydroxyl or nitro group or a hydrogen, fluorine, chlorine or bromine atom; where D is a methyl, methoxy, trifluoromethyl, hydroxyl or nitro group or a hydrogen, fluorine, chlorine or bromine atom; where M is a methyl, methoxy, trifluoromethyl, hydroxyl or nitro group or a hydrogen, fluorine, chlorine or bromine atom; where R_2 is a hydrogen atom or methyl group; where $R_{2\alpha}$ is a hydrogen atom, alkyl 1 thru 4 carbon atoms or benzyl; where $R_{2\beta}$ is a hydrogen atom or methyl group with the proviso that when $R_{2\beta}$ is methyl, $R_{2\alpha}$ is also methyl; where $R_{2\alpha}$ is alkyl of 1 thru 3 carbon atoms or



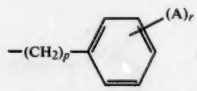
;

where R_3 is alkyl of 1 thru 4 carbon atoms or phenyl; where R_6 is a hydrogen atom or methyl group; where R_7 is a hydrogen atom or methyl group; where $R_{17\alpha}$ is a hydrogen atom, alkyl of 1 thru 4 carbon atoms, alkenyl of 2 thru 4 carbon atoms or alkynyl of 2 thru 4 carbon atoms; where $R_{17\beta}$ is alkyl of 1 thru 16 carbon atoms,



,

$—(CH_2)_n—CH(CH_2)_m$, $—CH_2—$alkenyl where alkenyl is 2 thru 15 carbon atoms or $—CH_2—C{=}CH$, and $R_{17\alpha}$ and $R_{17\beta}$ can be connected to form a cyclic ether containing 4 or 5 carbon atoms; where Q is an oxygen atom; where X is a fluorine, chlorine or bromine atom; where Z is a hydrogen atom, alkyl of 1 thru 4 carbon atoms or



,

that for the compounds of formula (XIV) the Z's may be the same or different; where m is 4 thru 6; where n is 0 thru 4; where p is 0 thru 4; where q is 1 or 2, when q is 2 the M's can be the same or different; where r is 1 or 2, when r is 2 the A's can be the same or different; where y is 1 or 2, when y is 2 the D's can be the same or different; where μ is 0 thru 4; where ~ indicates the attached group can be in either the α or β configuration; and where is a single or double bond, if a single bond the hydrogen atom at C_5 is α; including the oximers and O-substituted oximes of compounds I thru IV and VI made with $NH_2—OR_3$ to a male mammal post-puberty selected from the group consisting of man, male dog, tom, bull, stallion, ram, boar, male rat, and male mouse.

4,297,351

METHOD OF MANUFACTURE AND USE OF IMPROVED 2β, 16β-PIPERIDINO ANDROSTANES

Ian C. Carlyle, Hamilton; Thomas Sleigh, Wishaw, and David S. Savage, Glasgow, all of Scotland, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 67,878, Aug. 20, 1979, Pat. No. 4,237,126. This application Oct. 7, 1980, Ser. No. 194,942

Claims priority, application United Kingdom, Sep. 5, 1978, 35667/78

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—241 **44 Claims**

1. A method for the preparation of a pharmaceutically acceptable acid addition salt of the 16β-mono-quaternary ammonium derivative of either a 3α,17β-di-lower aliphatic ester of 2β,16β-dipiperidino-3α,17β-dihydroxy-5α-androstane or a 3α-lower aliphatic ester of 2β,16β-dipiperidino-3α-hydroxy-5α-androstane comprising

adding a pharmaceutically acceptable acid to the 16β-mono-quaternary ammonium derivative of either a 3α,17β-di-lower aliphatic ester of 2β,16β-dipiperidino-3α,17β-dihydroxy-5α-androstane or a 3α-lower aliphatic ester of 2β,16β-dipiperidino-3α-hydroxy-5α-androstane in a suitable solvent.

2. In the method for the administration of a neuromuscular blocking agent by injection to a surgical patient, the improvement which comprises

using as said neuromuscular blocking agent an effective amount of a pharmaceutically acceptable acid addition salt of the 16β-mono-quaternary ammonium derivative of either a 3α,17α-di-lower aliphatic ester of 2β,16β-dipiperidino-3α,17β-dihydroxy-5α-androstane or a 3α-lower aliphatic ester of 2β,16β-dipiperidino-3α-hydroxy-5α-androstane.

4,297,352

NOVEL OXIMES

Rene Heymes, Romainville, and Andre Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

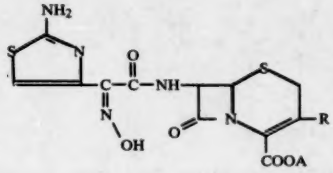
Division of Ser. No. 964,517, Nov. 29, 1978, Pat. No. 4,260,747. This application Nov. 29, 1979, Ser. No. 98,636

Claims priority, application France, Dec. 5, 1977, 77 36513

Int. Cl.³ A61K *31/545*

U.S. Cl. 424—246 **7 Claims**

1. The syn isomers of 3-substituted 7-amino-thiazolyl-acetamido-cephalosporanic acid compounds of the formula



wherein R is selected from the group consisting of cycloalkyl of 3 to 5 carbon atoms and —CH_2—S—R_1, R_1 is acyl of an organic carboxylic acid of 2 to 4 carbon atoms and A is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, magnesium and a non-toxic, pharmaceutically acceptable organic amine.

4. An antibacterial composition comprising an antibacterially effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,297,353

NON-IRRITATING INJECTABLE DOSAGE FORMS

Hawkins V. Maulding, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 4, 1980, Ser. No. 175,817
Int. Cl.³ A61K *31/23, 31/54, 47/00*
U.S. Cl. 424—247 **10 Claims**

1. Method of administering without irritation an injectable dosage form of a tissue irritating medicament, which comprises administering to a patient in need of the medicament, a therapeutically effective amount of thioridazine, in base form in association with a sufficient amount of a pharmaceutically acceptable glyceride vehicle comprising a glycerol ester of a saturated or unsaturated fatty acid which fatty acid has from 6 to 20 carbon atoms or mixtures thereof to form an injectable dosage form.

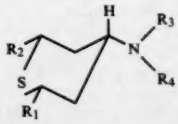
4,297,354

SUBSTITUTED 4-AMINO-2,6-DIARYL-TETRAHYDROTHIOPYRANS AND SALTS THEREOF, AND USE AS ANTIDEPRESSANTS

Karl-Heinz Weber, Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen am Rhein; Karl-Heinz Pook; Karin Böke, both of Ingelheim am Rhein, and Wolf D. Bechtel, Appenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,423
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951634
Int. Cl.³ A61K *31/38, 31/445;* **C07D** *335/02*
U.S. Cl. 424—248.51 **13 Claims**

1. A compound of the formula



or

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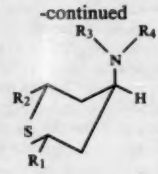


wherein

R_1 and R_2 are each phenyl; mono-, di- or tri-substituted phenyl, where the substituents are halogen, methyl or methoxy; thienyl; or furyl;

R_3 is hydrogen or alkyl of 1 to 3 carbon atoms; and

R_4 is alkyl of 1 to 3 carbon atoms; or

R_3 and R_4, together with each other and the nitrogen atoms to which they are attached, form a piperidino, 4-amino-piperidino, 4-(lower alkyl-amino)-piperidino, piperazino, 4-(alkyl of 1 to 2 carbon atoms)-piperazino or morpholino radical; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

13. The method of preventing or relieving depression in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antidepressant amount of a compound of claim 1.

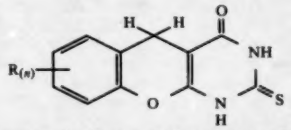
4,297,355

(1H,3H,5H)-(1)-BENZOPYRANO-(2,3-D)-PYRIMIDINE-4-ONE-2-THIONES AND THEIR USE AS ANTI-ALLERGY AGENTS

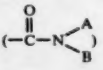
David J. Blythin, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Nov. 15, 1979, Ser. No. 94,407
The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.
Int. Cl.³ A61K *31/505;* **C07D** *491/052*
U.S. Cl. 424—248.54 **13 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein R represents hydrogen, lower alkyl, lower cyclo alkyl, acyloxy-lower alkyl, hdyroxylower alkyl, lower alkoxyloweralkyl, nitro, halogeno, hydroxy, lower alkoxy, carboxyl, carboxamido, lower alkoxycarbonyl, tetrazolyl or cyano, and n is one or two, wherein said carboxamido has the partial structural formula



wherein A is straight or branched chain alkyl with up to 12 carbon atoms, lowercycloalkyl, lowercycloalkylloweralkyl, loweralkoxyloweralkyl, hydroxyloweralkyl, fluoroloweralkyl, loweralkenyl, loweralkylthioloweralkyl, loweralkylsulfoxy-loweralkyl, loweralkylsulfonylloweralkyl, thiazolyl, oxazolyl, thiadiazolyl, methylthiadizaolyl, furyl, pyrazolyl, tetrazolyl, methyltetrazolyl, phenyl, or the grouping ER_4 wherein E is a straight or branched chain or cyclic loweralkylene optionally substituted with hydroxy or phenyl radicals, R_4 is phenyl, thiazolyl, oxazolyl, thiadiazolyl, methylthiadiazolyl, tetrazolyl, methyltetrazolyl, furyl, pyridyl, methylpyridyl or piperidinyl; and B is hydrogen, loweralkyl, lowercycloalkyl, lowercycloal-

kylloweralkyl, or loweralkenyl; or A and B, when taken together with the nitrogen atom to which they are attached, represent imidazolyl, morpholinyl, pyrrolidinyl, piperidinyl or piperazinyl, said heterocyclic rings being optionally substituted by hydroxy, loweralkyl or hydroxyloweralkyl.

10. A method for effecting an anti-allergic reaction useful in the prophylactic treatment of animals for allergic and anaphylactic reactions which comprises administering to an animal in need of such therapy a therapeutically useful quantity of a compound of claim **1**.

11. An anti-allergy pharmaceutical composition comprising an effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

4,297,356

MEMORY ENHANCER CONTAINING 2-(7-INDENYLOXYMETHYL-MORPHOLINE

Minoru Yamamoto, Kanagawa; Shiro Tachikawa, Omiya, and Hiroo Maeno, Shiki, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 181,068

Claims priority, application Japan, Mar. 5, 1980, 55/26742

Int. Cl.[3] **A61K** *27/00*

U.S. Cl. 424—248.57 **4 Claims**

1. A method of enhancing memory in an adult requiring enhancement of said memory comprising administering to said adult on effective amount of a composition administering an effective amount of 2-(7-indenyloxymethyl)morpholine or an acid addition salt thereof and a pharmaceutically acceptable carrier therefor.

4,297,357

N-PHENETHYLACETAMIDE COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

Tosaku Miki, and Masahide Asano, both of Minamifunabori, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

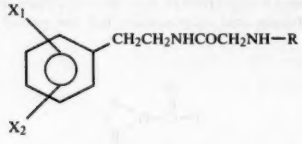
Filed Aug. 27, 1979, Ser. No. 70,085

Claims priority, application Japan, Aug. 25, 1978, 53-103652; Jul. 25, 1979, 54-94597

Int. Cl.[3] **A61K** *31/505, 31/44, 31/165*

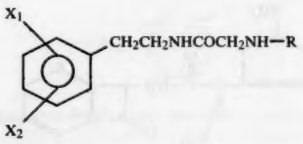
U.S. Cl. 424—251 **9 Claims**

1. N-phenethylacetamide compounds of the formula:



wherein X_1 represents a lower alkoxy group, X_2 represents a hydrogen atom or a lower alkoxy group and R represents a phenyl group, a pyridyl group or a pyrimidinyl group, each of which may have one or more substituents selected from a halogen atom, a carbamoyl group, a lower alkoxy group, a sulfamoyl group, an amino group, a lower alkylamino group, a lower alkylthio group, a hydroxy group and a lower alkoxycarbonyl group; or the pharmaceutically acceptable acid addition salts and hydrates thereof.

6. A therapeutic agent for treating peptic ulcer comprising in an amount effective for treating pepetic ulcer at least one N-phenethylacetamide compound of the formula:



wherein X_1 represents a lower alkoxy group, X_2 represents a hydrogen atom or a lower alkoxy group, and R represents a phenyl group, a pyridyl group or a pyrimidinyl group, each of which may have one or more substituents selected from a halogen atom, a carbamoyl group, a lower alkoxy group, a sulfamoyl group, an amino group, a lower alkylamino group, a lower alkylthio group, a hydroxy group and a lower alkoxycarbonyl group; or the pharmaceutically acceptable acid addition salts and hydrates thereof, and a pharmaceutically acceptable carrier.

4,297,358

NOVEL 4,7-PHENANTHROLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE

Georges Haas, Binningen; Knut A. Jaeggi, Basel; Alberto Rossi, Oberwil, and Alex Sele, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

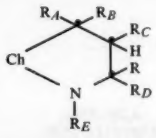
Filed Jan. 4, 1980, Ser. No. 109,715

Claims priority, application Switzerland, Jan. 16, 1979, 402/79

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/435*

U.S. Cl. 424—256 **13 Claims**

1. A 4,7-phenanthroline derivative of the formula



(I)

in which

Ch represents 5,6-quinolinylene which is unsubstituted or c-substituted by one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy and/or halogen,

R represents carboxy, lower alkoxycarbonyl, hydroxylower alkoxycarbonyl, lower alkoxy-lower alkoxycarbonyl, di-lower alkylamino-lower alkoxycarbonyl, and in which either

R_A and R_B together represent oxo,

R_C and R_D together represent an additional link and R_E represents hydrogen, or

R_A represents hydroxy, lower alkoxy or lower alkenyloxy and

R_B together with R_C and R_D together with R_E in each case represents an additional link,

or a pharmaceutically acceptable salt of a salt-forming compound of the formula (I).

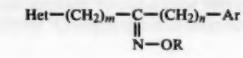
13. A pharmaceutical composition useful as inhibitors of allergic reactions containing an effective amount of a compound as claimed in claim **1**, together with customary pharmaceutical auxiliaries and carriers.

4,297,359
ANTI-ULCER COMPOSITIONS CONTAINING CERTAIN PYRIDYL OXIME ETHERS

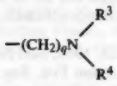
Jacob A. van Zorge, Ameide, Netherlands, assignor to ACF Chemiefarma NV, Netherlands

Filed Jul. 11, 1979, Ser. No. 56,543
Claims priority, application United Kingdom, Jul. 25, 1978, 30951/78
Int. Cl.³ C07D *405/06, 409/06;* A61K *31/44*
U.S. Cl. 424—263 14 Claims

1. A compound selected from the group consisting of
(a) a pyridine compound of the formula:



wherein
Het is pyridin-2-yl, pyridin-3-yl, or pyridin-4-yl, unsubstituted or substituted with halo, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;
Ar is thien-2-yl, thien-3-yl, fur-2-yl or fur-3-yl unsubstituted or substituted with halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, trifluoromethyl or hydroxymethyl;
R is alkyl of 1 to 3 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms, or



wherein q has a value of 2 or 3 and each of R^3 and R^4 independently of the other is hydrogen or alkyl of 1 to 3 carbon atoms; and
each of m and n is 0 or 1, the sum of m and n being less than 2;
(b) the N-oxides thereof and (c) the pharmaceutically acceptable acid addition and quaternary addition salts of said pyridine compounds or said N-oxides thereof.

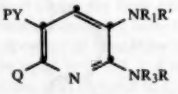
14. The method of treating gastric ulcers in humans which comprises administering thereto an effective amount of a compound according to claim 1.

4,297,360
5-(PYRIDINYL)PYRIDINE-2,3-DIAMINES, PREPARATION THEREOF AND THEIR CARDIOTONIC USE

George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 28, 1980, Ser. No. 135,100
Int. Cl.³ C07D *401/04;* A61K *31/44;* C07D *413/14;* A61K *31/535*
U.S. Cl. 424—263 14 Claims

1. A 2-R_3RN-3-R_1RN-5-PY-6-Q-pyridine having the formula



or pharmaceutically-acceptable acid-addition salt thereof, where Q, R and R' are each hydrogen or lower-alkyl, PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, and, R_1 and R_3 are each hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkgages and NB is di-(lower-alkyl)amino or 4-morpholinyl.

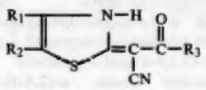
12. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of a cardiotonic 2-NRR-3-NR'R'-5-PY-6-Q-pyridine or pharmaceutically-acceptable acid-addition salt thereof, where Q is hydrogen or lower-alkyl, PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, and NRR and NR'R' are each amino, lower-alkylamino or di-(lower-alkyl)amino.

4,297,361
THIAZOLYLIDENE-OXO-PROPIONITRILES, INSECTICIDAL COMPOSITION CONTAINING THESE COMPOUNDS

Reinhold Puttner; Ulrich Bühmann, and Harmut Joppien, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,109
Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2920183
Int. Cl.³ C07D *417/04, 277/38;* A01N *43/40, 43/78*
U.S. Cl. 424—263 21 Claims

1. Thiazolylidene-oxo-propionitriles of the formula



wherein
R_1 is phenyl, methylphenyl, halogenophenyl, tert.-butyl, pyridyl or thienyl,
R_2 is hydrogen, bromine or methyl, and
R_3 is phenyl substituted in one or two positions by the same or different radicals selected from the group consisting of methyl, fluoro, chloro, bromo, iodo, trifluoromethyl, nitro or methoxy.

21. An insecticidal composition comprising about 5 to 95% by weight of a compound as defined in claim 1 and about 95 to 5% by weight of liquid or solid carrier materials to which there may be added, upon corresponding reduction of the carrier materials, up to 20% by weight of surface active agents.

4,297,362
4-(3,4-DIAMINOPHENYL)PYRIDINE OR SALTS, AND USE THEREOF AS CARDIOTONIC

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 40,210, May 18, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 173,003
Int. Cl.³ C07D *213/38;* A61K *31/44*
U.S. Cl. 424—263 5 Claims

1. 4-(3,4-Diaminophenyl)pyridine or pharmaceutically-acceptable acid-addition salt thereof.

4,297,363
2-AMINO-3(4 OR 5)-(PYRIDINYL)PHENOLS AND THEIR USE AS CARDIOTONICS

George Y. Lesher, Shodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,896
Int. Cl.³ C07D *213/30;* A61K *31/44*
U.S. Cl. 424—263 12 Claims

1. 2-Amino-3(4 or 5)-PY-phenol or pharmaceutically-acceptable acid-addition salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

9. The method for increasing cardiac contractility in a pa-

tient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically-effective amount of 2-amino-3(4 or 5)-PY-phenol or pharmaceutically-acceptable acid-addition salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,297,364

α-AZOLYL-α-PHENYLACETIC ACID DERIVATIVES

Hubert Sauter; Bernd Zeeh, both of Ludwigshafen; Costin Rentzea, Heidelberg, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,243

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845293

Int. Cl.³ A01N *43/64, 43/84;* **C07D** *249/08, 401/06*

U.S. Cl. 424—267 **4 Claims**

1. A compound selected from the group consisting of α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-t-butyl ester, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N,N-diisopropyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-cyclohexyl-N-methyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-t-butyl-N-cyclohexyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-[t]n-butyl-N-isopropyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-4-chlorophenyl-N-methyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-isopropyl-N-phenyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-2,6-dimethylpiperidide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-t-butyl-N-methyl amide, α-phenyl-α-(1,2,4-triazol-1-yl)-acetic acid-N,N-diisopropyl amide, α-(4-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-but-1-yn-3-yl amide, α-(4-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-diisobutyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-isopropyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-isobutyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-isopentyl ester, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-propenyl-N-cyclohexyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-isopropyl-N-benzyl amide, α-phenyl-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-t-butyl amide, α-(4-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-n-butyl-N-t-butyl amide, α-(4-chlorophenyl)-α-(imidazol-1-yl)-acetic acid-N-n-butyl-N-t-butyl amide, and α-(2-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-isopropyl-N-phenyl amide.

4. A fungicidal agent for combating powdery mildew consisting essentially of from 0.1 to 95% by weight of a compound selected from the group as claimed in claim **1** and a solid or liquid carrier.

4,297,365

BENZIMIDAZOLES AND PHARMACEUTICAL PREPARATIONS CONTAINING SUCH COMPOUNDS

Srinivasachari Rajappa, and Vasudevan Sudarsanam, both of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

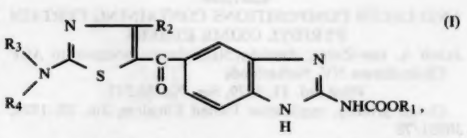
Filed Jul. 26, 1979, Ser. No. 61,097

Claims priority, application Switzerland, Aug. 4, 1978, 8359/78

Int. Cl.³ C07D *277/28*

U.S. Cl. 424—270 **10 Claims**

1. A benzimidazole carbamate of the formula I,



(I)

in which R_1 is lower alkyl, R_2 is a member selected from the group consisting of hydrogen or lower alkyl and R_3 and R_4 are each a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, cycloalkyl and phenyl and R_3 and R_4 taken together with adjacent nitrogen atom are lower alkylene-amino, a tautomeric compound thereof or a salt thereof.

4,297,366

COMBATING ARTHROPODS WITH 2,2-DIMETHYL-3-(2-FLUOROALKYL-2-OXY-VINYL)-CYCLOPROPANE-CARBOXYLIC ACID ESTERS

Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

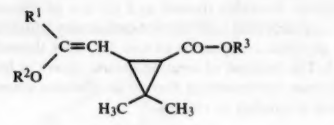
Filed Apr. 23, 1980, Ser. No. 142,928

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919820

Int. Cl.³ A01N *53/00;* **C07C** *69/743, 121/75;* **C07D** *209/34*

U.S. Cl. 424—274 **10 Claims**

1. A 2,2-dimethyl-3-(2-fluoroalkyl-2-oxy-vinyl)-cyclopropanecarboxylic acid ester of the formula

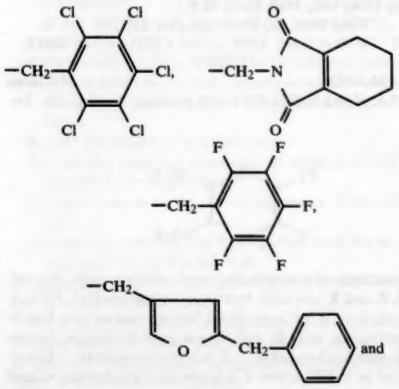


in which

R^1 is C_1–C_4-fluoroalkyl or C_1–C_4-chlorofluoroalkyl,

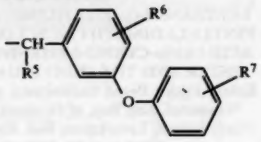
R^2 is C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_5–C_6-cycloalkyl or benzyl,

R^3 is



and

-continued



R^5 is hydrogen, cyano, ethynyl, methyl or ethyl, and R^6 and R^7 each independently is hydrogen or halogen.

7. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,297,367

2-PHENYL-4-PYRONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS FUNGICIDES

Francois Guigues, Rillieux, and Stephane Trinh, Champagne au Mont d'Or, both of France, assignors to Rhone Poulenc Agrochemie, Lyons, France

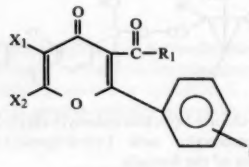
Filed Mar. 24, 1980, Ser. No. 133,480

Claims priority, application France, Mar. 28, 1979, 79 08569

Int. Cl.³ A61K *31/35;* **C07D** *309/32*

U.S. Cl. 424—283 **7 Claims**

1. A 2-phenyl-4-pyrone derivative of the formula



in which X_1 and X_2, which are identical or different, each represent a hydrogen or halogen atom, with the proviso that at least one of these substituents represents a halogen atom, R_1 represents an alkoxy radical containing from 1 to 4 carbon atoms, an alkenyloxy radical containing from 2 to 4 carbon atoms, the propargyloxy radical, a halogenoalkoxy radical containing from 1 to 4 carbon atoms, an amino radical, an alkylamino radical containing from 1 to 4 carbon atoms or a dialkylamino radical in which the alkyl groups containing from 1 to 4 carbon atoms are identical or different, R_2 represents a halogen atom, an alkyl radical containing from 1 to 5 carbon atoms, an alkoxy radical containing from 1 to 4 carbon atoms, an alkenyloxy radical containing from 3 to 4 carbon atoms, an alkynyloxy radical containing from 3 to 4 carbon atoms, an alkylthio radical containing from 1 to 4 carbon atoms, a halogenoalkyl radical containing from 1 to 4 carbon atoms, a halogenoalkoxy radical containing from 1 to 4 carbon atoms, a halogenoalkylthio radical containing from 1 to 4 carbon atoms or a nitro, hydroxyl, cyano or benzyloxy radical and n is an integer which can be equal to 0, 1, 2, 3, 4 or 5, it being understood that, if n is greater than or equal to 2, the substituents R_2 can be identical or different.

5. A composition for protecting plants against fungal diseases, which contains an effective amount of at least one compound according to claim 1, in association with a carrier and/or a surface-active agent which can be used in agriculture and are compatible with the said active ingredient.

4,297,368

PHARMACEUTICALLY USEFUL 5,6-SATURATED PGI COMPOUNDS

Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Alessandro Andreoni, Cologno Monzese; Angelo Fumagalli, Monza; Franco Faustini, Milan; Roberto Ceserani, Milan, and Maria M. Usardi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

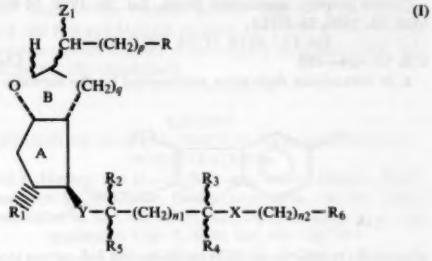
Division of Ser. No. 859,703, Dec. 12, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,166

Claims priority, application Italy, Dec. 31, 1976, 31041 A/76; Jan. 14, 1977, 19283 A/77; Mar. 14, 1977, 21171 A/77; Mar. 21, 1977, 21412 A/77; Mar. 31, 1977, 21863 A/77

Int. Cl.³ C07D *307/935*

U.S. Cl. 424—285 **50 Claims**

1. A compound of the formula (I)



(I)

wherein

R is a free carboxy group or an esterified carboxy group of the formula $—COOR_c$, wherein R_c is a C_1–C_{12}alkyl radical or a C_2–C_{12} alkenyl radical;

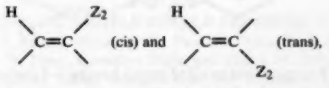
Z_1 is hydrogen or halogen;

p is zero or an integer of 1 to 7;

q is 1;

R_1 is hydrogen, hydroxy, C_1–C_6 alkoxy, benzyloxy C_2–C_{12} alkanoyloxy or benzoyloxy;

Y is a member selected from the group consisting of —C≡C—,



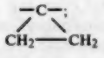
wherein

Z_2 is halogen or —CH=CH—(cis);

one of R_2 and R_5 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl or phenyl, α-naphthyl or β-naphthyl, and the other is hydroxy, C_1–C_6 alkoxy, benzyloxy, or R_2 and R_5, taken together form an oxo group;

each of R_3 and R_4, which are the same or different, may be hydrogen C_1–C_6 alkyl or fluorine or R_3 and R_4, taken together with the carbon atom to which they are linked, form the radical

or the radical



each of n_1 and n_2, which are the same or different, is zero or an integer of 1 to 6;

X is $-(CH_2)_m-$, wherein m is zero or 1;

R_6 is a C_3–C_9 cycloalkyl or C_3–C_9 cycloalkenyl, unsubstituted or substituted by one or more substituents selected from the group consisting of C_1–C_6 alkyl and C_1–C_6 alkoxy;

and the pharmaceutically or veterinarily acceptable salts thereof.

4,297,369
CERTAIN MUSCLE RELAXANT 3-METHYL-2-BENZOFURAN ACETAMIDES

Hiroshi Takizawa, Shizuoka; Yutaka Enomoto, Sakai; Yoshimasa Oiji, Shizuoka; Tatsuyuki Hirayama, Shizuoka, and Tamotu Hashimoto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

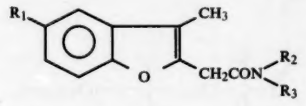
Filed Jul. 28, 1980, Ser. No. 172,949

Claims priority, application Japan, Jul. 26, 1979, 54-94180; Mar. 12, 1980, 55-30312

Int. Cl.³ A61K *31/34;* **C07D** *307/54*

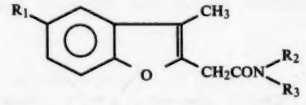
U.S. Cl. 424—285 **8 Claims**

1. A benzofuran derivative represented by the formula:



wherein R_1 represents an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, a phenyl group or a halogen atom, and R_2 and R_3 may be the same or different and represent a hydrogen atom or an alkyl group having 1–4 carbon atoms wherein, when one of R_2 and R_3 represents a hydrogen atom, the other represents an alkyl group.

5. A muscle relaxant pharmaceutical composition containing, as the active ingredient, a muscle relaxant amount of the benzofuran derivative represented by the formula:



wherein R_1 represents an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, a phenyl group or a halogen atom, and R_2 and R_3 may be the same or different and represent a hydrogen atom or an alkyl group having 1–4 carbon atoms wherein, when one of R_2 and R_3 represents a hydrogen atom, the other represents an alkyl group, and at least one pharmaceutically acceptable carrier.

4,297,370
INSECTICIDAL COMPOSITIONS

Edward J. Soboczenski, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 963,949, Nov. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 804,358, Jun. 7, 1977, abandoned. This application Feb. 6, 1980, Ser. No. 119,295

Int. Cl.³ A01N *37/00, 37/08, 37/34*

U.S. Cl. 424—298 **8 Claims**

1. An insecticidal composition consisting essentially of

(A) N,N'-[thiobis(methylaminocarbonyloxy]bis[ethanimidothioic acid], dimethyl ester; and

(B) cyano-(3-phenoxyphenyl)-methyl 4-chloro-α-(1-methylethyl)benzeneacetate, or (3-phenoxybenzyl) cis-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropenecarboxylate, wherein a ratio of (A) to (B) is in a range of from 20:1 to 3:1 by weight.

4,297,371
COMBATING PESTS WITH (±)-TRANS-3-(E/Z-2-CHLORO-2-(4-CHLOROPHENYL)-VINYL)-2,2-DIMETHYL-CYCLOPROPANECARBOXYLIC ACID (±)-(α-CYANO-3-PHENOXY-4-FLUORO-BENZYL) ESTER AND THE INDIVIDUAL E- AND Z-ISOMERS

Rainer Fuchs; Bernd Gallenkamp, and Wilhelm Stendel, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

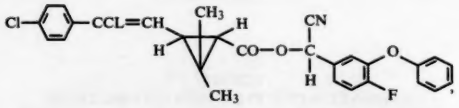
Filed Aug. 29, 1980, Ser. No. 182,356

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936864

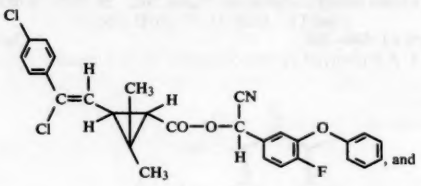
Int. Cl.³ A01N *53/00;* **C07C** *61/35, 69/743, 121/75*

U.S. Cl. 424—304 **10 Claims**

1. A substantially pure isomer mixture selected from the group consisting of (±)-trans-3-(E/Z-2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-2-cyano-3-phenoxy-4-fluoro-benzyl ester of the formula

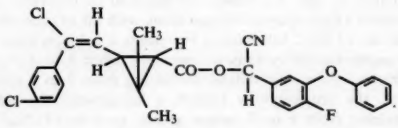


(±)-trans-3-(Z-2-chloro-2-(4-chloro-phenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-α-cyano-3-phenoxy-4-fluoro-benzyl ester of the formula



, and

(±)-trans-3-(E-2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-α-cyano-3-phenoxy-4-fluoro-benzyl ester of the formula



6. A method of combating ectoparasites which comprises applying to such ectoparasites or to a habitat thereof an ectoparasiticidally effective amount of an isomer mixture according to claim 1.

4,297,372
UREIDE INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

Seymour Bernstein, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

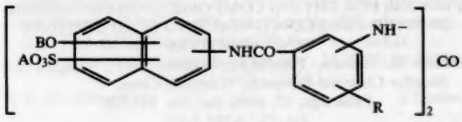
Division of Ser. No. 971,174, Dec. 20, 1978, Pat. No. 4,216,164, which is a continuation-in-part of Ser. No. 833,319, Sep. 14, 1977, Pat. No. 4,131,684, which is a division of Ser. No. 684,601, May 10, 1976, abandoned. This application Feb. 4, 1980, Ser. No. 118,046

Int. Cl.³ A61K *31/185*

U.S. Cl. 424—315 **4 Claims**

1. A method of inhibiting connective tissues destruction in a warm-blooded animal suffering from said connective tissue

destruction which comprises administering to said animal an effective connective tissue destruction inhibiting amount of a compound selected from those of the formula:



wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower (C_1–C_6) alkanoyl or alkali metal; and R is hydrogen.

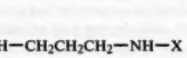
4,297,373

METHOD OF SUPPRESSING CARDIAC ARRHYTHMIAS

Theodore S. Sulkowski, Wayne; James L. Bergey, Lansdale, and Albert A. Mascitti, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,568
Int. Cl.[3] A61K *31/17*; C07C *127/00*
U.S. Cl. 424—322 6 Claims

1. A method of suppressing cardiac arrhythmias in warm-blooded animals comprising administering to an animal in need thereof an amount effective to suppress such arrhythmia of a compound of the formula:



wherein:

Y is 2,6-dimethylphenyl, 2,5-dimethylphenyl, 5-bromo-2-methylphenyl, or 5-chloro-2-methylphenyl; and

X is propenyl, propynyl, or cyclopropyl;

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,297,374

SKIN MOISTURIZING AND CLEANSING CREAM

Beatrice M. Wess, 3590 Fenley Rd., Cleveland Heights, Ohio 44121

Filed Oct. 11, 1979, Ser. No. 83,597
Int. Cl.[3] A61K *47/00*
U.S. Cl. 424—364 13 Claims

1. A skin moisturizing and cleansing cream comprising by volume of mixture a predominant amount of fresh fruit selected from the group consisting of bananas and avocados, the remainder being orange juice, vegetable shortening and baking powder, and said orange juice and shortening together constituting the larger proportion of said remainder.

4,297,375

SALT SUBSTITUTES HAVING REDUCED BITTERNESS

John R. Shackelford, LaGrange, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 21, 1979, Ser. No. 77,562
Int. Cl.[3] A23L *1/237*
U.S. Cl. 426—62 7 Claims

1. A sodium-free salt substitute comprising potassium chloride and an amount of autolyzed yeast effective to reduce the bitterness caused by the potassium chloride.

4,297,376

CORN-BASED SNACK PRODUCT OF NUT-LIKE CONSISTENCY

Richard L. Nelson, 699 Riverside Dr., Battle Creek, Mich. 49015, and Walter P. Nelson, 4045 Gull Lake Dr. West, Richland, Mich. 49083

Filed Mar. 17, 1980, Ser. No. 130,749
Int. Cl.[3] A21D *2/36*
U.S. Cl. 426—94 11 Claims

1. A method of making an edible food product having a binder of ground corn dough comprising the steps of: preparing a ground corn dough; adding about one to ten percent by weight of uncooked, unhulled sesame seeds and about 0.5 to 2 percent by weight of algin to form a firm doughy mixture having about forty to fifty percent by weight water; molding said mixture to form a relatively three-dimensional raw article having a thickness which is at least about twenty-five percent of the width of the molded mixture forming a raw article; frying said raw article in oil, at about 325°–375° F., for a period of about six to ten minutes to thoroughly cook said article to a crunchy nut-like consistency.

4,297,377

METHOD OF MAKING FRENCH FRYABLE FROZEN POTATO STRIPS

David L. Harney, and Harlow S. Young, both of Othello, Wash., assignors to Chef-Reddy Foods Corporation, Othello, Wash.

Continuation of Ser. No. 6,099, Jan. 24, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,708
Int. Cl.[3] A23B *7/03*; A23L *1/216*
U.S. Cl. 426—438 5 Claims

1. The method of producing French fried potatoes which comprises dividing raw, unblanched potatoes into strips, heating the strips, thereby partially gelatinizing the strips substantially throughout, partially dehydrating the strips until the partially gelatinized and partially dehydrated strips weigh about 75% to 80% of their weight when raw and the cell structure is finely granular, parfrying the partially gelatinized and partially dehydrated strips, freezing the parfried strips, and thereafter finish frying the strips without the strips having been blanched.

4,297,378

REFRIGERATED SHELF STABLE PIE CRUST DOUGH

Michael J. Haasl, Minneapolis; Paul D. Pratt, New Brighton; Rocky W. Chen, Brooklyn Park, and Helen M. Fett, Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Jan. 31, 1980, Ser. No. 117,311
Int. Cl.[3] A21D *13/08*
U.S. Cl. 426—532 14 Claims

1. A dough composition adapted for making pie crust which exhibits reduced Maillard browning, said composition including:

a flour blend present in the dough in an amount in the range of between about 38% and about 50% by weight, said proportion of flour blend being calculated on the basis of dry flour blend in the dough, said flour blend having an enzyme activity based on peroxidase of less than about 0.2 absorption units with said flour blend including (a) starch in an amount such that the dough contains starch in the range of between about 37% and 47% by weight of dough based on weight of dry starch, said starch having a damage level of less than about 10%; and (b) protein in an amount such that the dough contains protein in the range of between about 1.5% and about 6% by weight of dough;

shortening having an SFI value in the range of between about 29 and about 36 and a Wiley Melting Point in the range of between about 108° F. and about 118° F., said shortening being present in the dough in an amount in the range of between about 24% and about 35% by weight of dough; and

water in an amount in the range of between about 19% and about 25% by weight of dough.

4,297,379

FROZEN AERATED READY-TO-EAT GELATIN COMPOSITION

Harry H. Topalian, Dover; Clement R. Wyss, Lewes; Ralph E. Kenyon, and Anthony F. Dec, both of Dover, all of Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,609
Int. Cl.[3] A23L *1/04*
U.S. Cl. 426—565 **20 Claims**

1. Process for preparing a frozen aerated starch-free gelatin composition with smooth, creamy, continuous and uniform characteristics and which is ready-to-eat at freezer temperatures comprising:

dissolving a gelatin mix in water at a temperature sufficient to dissolve the mix, said mix comprising an amount of gelatin effective to stabilize the composition and provide a smooth and creamy texture without gummy or icy characteristics, said amount being within the range of from 0.6% to less than 5% of gelatin by weight of the composition, from 5% to 50% soluble solids by weight of the composition, and acid in an amount effective to impart a pH within the range of 2.5 to 7 to the composition.

cooling the dissolved mix to a temperature of from 10° to 32° F. to at least partially freeze the mix while simultaneously aerating and agitating the dissolved mix, the aeration creating an overrun of from 3 to 200% by volume of the composition;

shaping said aerated mix; and

freezing said shaped mix to a temperature less than 10° F., said frozen mix having ice crystals of a size within the range of 20 to 200 microns.

4,297,380

TEA FLAVORING PROCESS AND PRODUCT

Ian Horman, Corseaux, and Paul Cazenave, Chavornay, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 519,627, Oct. 31, 1974, abandoned. This application Feb. 23, 1977, Ser. No. 771,075
Int. Cl.[3] A23F *3/40;* A23L *1/226*
U.S. Cl. 426—597 **30 Claims**

5. A tea composition, comprising soluble tea solids and from about 0.25 to about 3 ppm methyl anthranilate as an aromatizing agent, based on the weight of the soluble tea solids.

4,297,381

METHOD OF FREEZING TOMATOES

Antonio Tenuta, Mongrassano Scalo, Cosenza, Italy

Continuation-in-part of Ser. No. 796,398, May 12, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 54,823
Int. Cl.[3] A23L *1/212, 3/36;* A23N *7/00*
U.S. Cl. 426—615 **8 Claims**

1. A method of freezing tomatoes and forming them into solid members free of preservatives and adapted for cutting, shaping and placement into plastic bags, comprising the steps of:

reducing the ambient temperature of the tomatoes to a freezing temperature of −30° C. for solidification,

cracking the external membrane of the solidified tomatoes by subjecting them to a temperature between 30° C. to 35° C. for a total temperature gradient of ΔT between 60° C. to 65° C. above said freezing temperature,

said cracking step includes the step of dipping said tomatoes into heated water having said temperature between 30° C. and 35° C.,

peeling the external membrance from the solidified tomatoes after cracking the external membrane, and reducing the temperature of the peeled tomatoes again to the freezing temperature of −30° C. for storage of peeled tomatoes free of preservatives.

4,297,382

PROCESS FOR DRYING COMPOSITIONS CONTAINING DERIVED PROTEIN-CONTAINING COMPOSITIONS AND ADDITIVES

Dennis B. Hosaka, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 17, 1980, Ser. No. 141,221
Int. Cl.[3] A23J *3/02*
U.S. Cl. 426—656 **15 Claims**

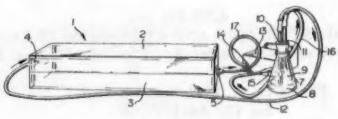
1. A process for preparing a dried egg albumin extender from an aqueous solution of an egg albumen extender comprising at least 65% of a low molecular weight protein-containing composition derived from plant or animal sources wherein the molecular weight of said derived protein-containing composition is less than 30,000, said composition having a total Kjeldahl nitrogen content of from about 0.45% to about 2.1% of which at least 60% of the nitrogen is non-protein nitrogen and a member selected from the group consisting of from about 1% to about 15% gelatin; from about 1% to about 15% gelatin and from about 5% to about 25% of a water soluble polyphosphate, the additive total of gelatin and phosphate not to exceed about 35%, from about 0.5% to about 5% of a gum, and mixtures thereof; and from 0% to about 30% of a whipping aid, all percentages being by weight based on the total dry solids weight of the egg albumen extender exclusive of starch which comprises preparing a blend of said egg extender solution and a starch which is water soluble or swellable under conditions of drying and which is used at a level sufficient to allow effective drying of said egg extender solution, adjusting the total solids of said blend to an amount between about 15% and about 35% by weight, and drying said solution.

4,297,383

APPARATUS AND METHOD FOR OBTAINING FINGERPRINTS

Louis P. Bourdon, R.R. #3, Hwy. 17, East Twin Lakes, North Bay, Ontario, Canada (P1B 8G4)

Filed Sep. 12, 1980, Ser. No. 186,624
Claims priority, application Canada, Jul. 15, 1980, 356161
Int. Cl.[3] A61B *5/10;* C23C *13/06*
U.S. Cl. 427—1 **8 Claims**



1. An apparatus for developing latent fingerprints on an object comprising a first chamber adapted to contain an object being tested for fingerprints, and to close to form an air tight seal, said first chamber having an inlet and an outlet, a second chamber adapted to contain a pool of and the vapors of the chemical cyanoacrylate, said second chamber having an inlet and an outlet, the outlet of said second chamber being connected by suitable tubing to the inlet of said first chamber, a recirculating pump means having an intake and an exhaust, said exhaust being connected to the inlet of said second chamber, said intake being connected to the outlet of said first chamber by suitable tubing, said recirculating pump means being adapted to circulate the vapors and air between said first and second chambers so as to expose said latent fingerprints to said vapors thereby developing visible fingerprints.

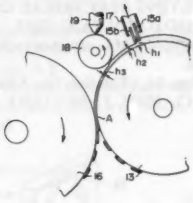
6. A method for developing latent fingerprints on an object comprising placing the object to be tested in a first chamber, sealing said first chamber, exposing the interior of said first chamber and the object therein to the vapors of the chemical cyanoacrylate until said latent fingerprints become visible.

4,297,384

METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGE

Yoshio Kudo; Masakazu Iwasa, and Hisashi Kato, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 886,446, Mar. 14, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 162,021
Claims priority, application Japan, Mar. 15, 1977, 52-28363
Int. Cl.³ G03G 13/08
U.S. Cl. 427—14.1 3 Claims



1. A method of developing an electrostatic latent image by use of an apparatus comprising an electrostatic latent image carrying member, a developing roller member for applying a toner layer on the electrostatic latent image carrying member, and a doctor blade associated with the developing roller member for scraping off a part of the toner layer for controlling the thickness of the toner layer wherein said doctor blade is applied with a voltage in the same polarity as that in which the toner is charged, said doctor blade having an edge located close to the surface of the developing member to scrape off a part of the toner layer on the developing member to obtain a predetermined thickness of the toner layer, and the toner scraped off by said doctor blade is sucked and exhausted by a suction means connected with said doctor blade, whereby the toner is prevented from sticking to the doctor blade.

4,297,385

PARTICULATED POLYETHERIMIDE AND METHOD FOR MAKING

Eugene G. Banucci, Scotia, and Edith M. Boldebuck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 37,437, May 9, 1979, abandoned. This application Apr. 7, 1980, Ser. No. 137,832
Int. Cl.³ B05D 3/02, 5/12; C08G 12/00, 69/26
U.S. Cl. 427—27 7 Claims

1. A method of coating a substrate with a continuous polyetherimide film which comprises,

(1) applying an organic solvent-free particulated polyetherimide having at least 50 mole percent of imide radicals based on the total moles of imide radicals and amide acid radicals onto the substrate, and

(2) fusing the particulated polyetherimide film at a temperature of at least 225° C.

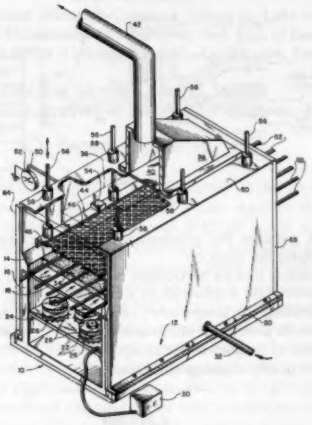
4,297,386

CONTROL GRID IN ELECTROSTATIC FLUIDIZED BED COATER

Donald J. Gillette, Guilford, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Jan. 23, 1980, Ser. No. 114,656
Int. Cl.³ B05D 1/06
U.S. Cl. 427—27 19 Claims

1. Electrostatic fluidized bed coating apparatus comprising, in combination: a housing having a generally planar substantially horizontal porous support member mounted therein to define within said housing a fluidization chamber thereabove and a plenum therebelow; means for introducing gas into said plenum for passage upwardly through said support member to effect fluidization of particulate coating material supplied to said chamber; means to effect electrostatic charging of such particulate material; and an electrically conductive, generally planar mesh-like control grid disposed within and substantially spanning the cross-sectional area of said chamber above said support member, said grid being substantially free of horizontal flat surfaces and being adapted for control of its electrical potential, and said housing being adapted for the passage of a workpiece therethrough at a location between and spaced from each of said support member and said grid, whereby the cooperative effects of fluidization and electrostatic charging may produce a cloud of electrostatically charged particulate material above said support member, and whereby said control grid may be used to densify and regulate such cloud, for improved coating.



16. A method for depositing of particulate material upon a workpiece comprising the steps of: forming within a fluidized bed of particles an electrostatically charged cloud thereof; increasing the density and uniformity of said cloud with an electrically conducting grid at a potential different from that of said charged particles; and passing through said cloud, at a level below and out of contact with said grid, a workpiece maintained substantially at the potential of said grid, whereby said article may acquire upon all of its exposed surfaces a substantially uniform deposit of said particles.

4,297,387

CUBIC BORON NITRIDE PREPARATION

Harry A. Beale, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jun. 4, 1980, Ser. No. 156,433
Int. Cl.³ C23C 11/00
U.S. Cl. 427—38 9 Claims

1. A method for deposition of cubic boron nitride on a substrate, which method comprises the steps of:

(a) supporting a substrate in a vacuum and heating the substrate;

(b) supplying metal vapors into a zone between the substrate and a metals alloy source, said source consisting essentially of at least 60 percent by weight to a balance of boron with from 2 to 12 percent by weight of aluminum and at least 0.2 to 24 percent by weight of at least one of cobalt, nickel, manganese or other aluminide-forming metal;

(c) introducing ammonia gas into said zone; and

(d) generating electrical field in said zone ionizing the metal vapors and gas atoms in the zone;

whereby a deposit comprised of cubic boron nitride is placed on the surface of said substrate.

4,297,388

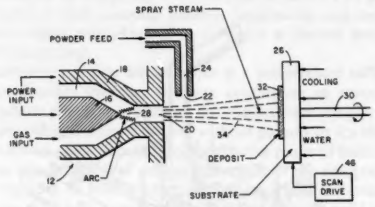
PROCESS OF MAKING PERMANENT MAGNETS

Kaplesh Kumar, Wellesley; Dilip K. Das, Bedford, and Ernest C. Wettstein, Acton, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation of Ser. No. 957,756, Nov. 6, 1978, abandoned. This application Apr. 8, 1980, Ser. No. 138,650

Int. Cl.³ B05D *3/14*

U.S. Cl. 427—47 **3 Claims**



3. A process for producing aligned permanent magnets comprising the steps of:

depositing molten particulate rare earth-cobalt alloy magnet material on a substrate in a crystalline state.

controlling the temperature of said substrate during deposition to provide a unidirectional heat flow across the deposit of magnet material; and

magnetically aligning said material.

4,297,389

ANTIFOAMING RESIN COMPOSITIONS

Robert W. Smearing, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 744,915, Nov. 26, 1976, abandoned, which is a division of Ser. No. 604,368, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 212,700, Dec. 23, 1971, abandoned. This application May 27, 1980, Ser. No. 153,306

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—58 **1 Claim**

1. In a method of providing electrical insulation for conductor bars which comprises vacuum-pressure impregnating electrical insulation with a polyester resin suitable for impregnating insulation, the improvement which consists of mixing with said resin from about 0.05 to 10 percent, based on the resin weight, of polybutadiene in which polybutadiene at least 80 percent of the olefinic unsaturation consists of pendant vinyl groups, said polybutadiene having no other functional groups, whereby foaming is substantially eliminated from the vacuum-pressure impregnating process.

4,297,390

PROCESS FOR THE PREPARATION OF A RED EMITTING PHOSPHOR COATED WITH RED IRON OXIDE AND ITS APPLICATION

Karl Franz, Barsinghausen, and Bernd Schönfeld, Bad Nenndorf, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,638

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900209

Int. Cl.³ C09K *11/46, 11/477, 11/465, 11/22*

U.S. Cl. 427—64 **11 Claims**

1. A method for the preparation of a red emitting phosphor coated with red iron oxide which comprises mixing an aqueous suspension of red emitting phosphor with a polysulfide solution and a solution containing iron (II) ions to form a mixture containing said phosphor with a coating of black iron sulfide precipitate, heating the mixture to a temperature in the range of 80° C. to 100° C. to form a grey pyrite coating on the phosphor, separating the grey pyrite coated phosphor from the aqueous phase of the mixture and heating and drying said coated phosphor at a temperature in excess of 250° C. in an oxidizing atmosphere to form a red iron oxide coating on said phosphor.

4,297,391

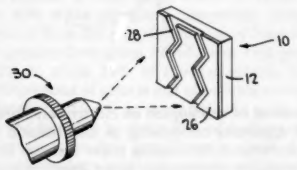
METHOD OF APPLYING ELECTRICAL CONTACTS TO A PHOTOVOLTAIC CELL

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Filed Jan. 16, 1979, Ser. No. 3,945

Int. Cl.³ H01L *31/04, 21/283*

U.S. Cl. 136—256 **4 Claims**



1. A method of applying an electrically conductive contact to the back surface of a photovoltaic cell, said back surface having a p-n junction located beneath and closely adjacent thereto, comprising forming particles of a metallic material at a temperature in excess of the alloying temperature of said material and silicon, and spraying said particles toward said back surface from a distance and at a temperature such that said particles penetrate said back surface and overcome said back surface p-n junction to form a high-low junction at said back surface as well as a back contact by a single process step.

4,297,392

HIGH FREQUENCY SPUTTERING PRODUCES THIN FILM AMORPHOUS SILICON PHOTOCONDUCTOR

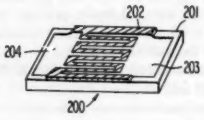
Akio Higashi; Kazuhiro Kawaziri, and Yosuke Nakajima, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 2, 1979, Ser. No. 90,721

Claims priority, application Japan, Nov. 2, 1978, 53-135179

Int. Cl.³ B05P *5/12;* G03G *5/08*

U.S. Cl. 427—75 **6 Claims**



1. A photoconductor cell comprising

a base plate;

a light-sensitive layer on said base plate; and

electrodes ohmically contacting said light-sensitive layer, wherein said light-sensitive layer comprises a thin film of amorphous silicon prepared by high frequency sputtering of elemental silicon under an atmosphere containing at least hydrogen onto said base plate, while maintaining the temperature of said base plate at about 50° C. to 150° C.

2. An electrophotographic element comprising

a base plate with an electrically conductive surface;

a light-sensitive layer on the electrically conductive surface of said base plate; and

an electrically insulating layer on said light-sensitive layer, wherein said light-sensitive layer comprises a thin film of amorphous silicon prepared by high frequenty sputtering of elemental silicon under an atmosphere containing at least hydrogen onto said base plate, while maintaining the temperature of said base plate at about 50° C. to 150° C.

4,297,393

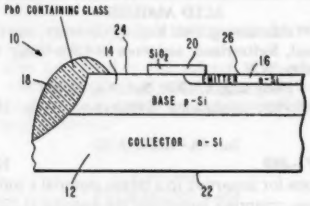
METHOD OF APPLYING THIN METAL DEPOSITS TO A SUBSTRATE

Richard Denning, Springfield; Mark A. Spak, Edison, and Barry Polhemus, Hampton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1980, Ser. No. 125,639

Int. Cl.³ C23C 3/02; H01L 21/288

U.S. Cl. 427—88 **20 Claims**



1. A method of applying thin metal sensitizing deposits from aqueous solution to the exposed silicon areas of a silicon substrate having exposed areas of silicon and silicon oxide, which comprises,

immersing the silicon substrate in a basic, aqueous solution containing a metal salt of the metal to be deposited, not containing a reducing agent and

reducing the metal ion by use of the exposed silicon as the reducing agent to the elemental metal.

4,297,394

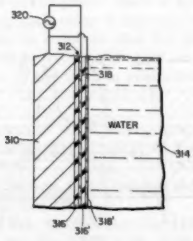
PIEZOELECTRIC POLYMER ANTIFOULING COATING AND METHOD OF USE AND APPLICATION

Bruce J. Wooden, Dickerson, and Seymour Edelman, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 44,130, May 31, 1979. This application Mar. 18, 1980, Ser. No. 132,607

Int. Cl.³ B05D 5/12; H01L 41/22

U.S. Cl. 427—100 **12 Claims**



1. A method of coating the outer surface of an electrically conductive marine structure with a plural layer continuous film for reducing fouling thereon comprising the steps of:

preparing the surface of the structure to insure maximum electrical conductivity;

applying a layer of electrically conductive cement to substantially the entire outer surface to be contacted by water containing fouling organisms;

applying a continuous layer of piezoelectric polymer over the cement;

applying another layer of electrically conductive cement to the polymer layer; and

applying another continuous layer of piezoelectric polymer for interfacing with water.

4,297,395

PRODUCTION OF COBALT-DOPED FERRIMAGNETIC IRON OXIDES

Gunter Buxbaum; Heinrich-Christian Schopper; Lutz Leitner, and Volker Hahnkamm, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 10, 1980, Ser. No. 110,876

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903593

Int. Cl.³ C01G 49/02

U.S. Cl. 427—127 **2 Claims**

1. A process for the production of a cobalt-doped iron oxide acicular pigment protected at least partly against sintering comprising forming a suspension of FeOOH seeds in water containing zinc, phosphate and ferrous ions, introducing cobalt ions, adding alkali and air to precipitate ferric and cobalt ions onto the seeds, adding a phosphate solution in quantity of from about 0.2 to 1% by weight of P_2O_5 into the water containing the seeds which are now pigment, separating the pigment from the suspension, reducing the pigment to Fe_3O_4, oxidizing the Fe_3O_4 pigment in an oxygen-containing gas to bring the FeO content in the pigment to about 16 to 24% by weight, and heat treating the oxidized pigment under inert conditions at a temperature of about 600° to 800° C., the amount of zinc, cobalt and phosphate ions present being such as to impart to the end product a content by weight of about 0.7 to 2.4% of cobalt, about 0.1 to 2% of zinc, and about 0.1 to 2% of phosphorus expressed as P_2O_5, the coercive force of the resulting pigment amounting to at least about 425 Oe+175 Oe/%, by weight, of Co.

4,297,396

COATING METHOD

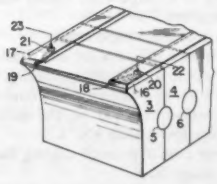
Nobumitsu Takehara, and Shogo Isayama, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 7, 1979, Ser. No. 101,383

Claims priority, application Japan, Dec. 19, 1978, 53-158762

Int. Cl.³ B05D 5/00

U.S. Cl. 427—284 **8 Claims**



1. A slide bead coating method comprising the steps of: supplying a first coating liquid over at least a portion of a slide surface between guide plates disposed on both sides of said slide surface and supplying a second coating liquid lower in viscosity than said first coating liquid at a flow rate lower than that of said first coating liquid to both sides of said slide surface through an aperture in each of said guide plates.

4,297,397

CATALYTIC PROMOTERS IN ELECTROLESS PLATING CATALYSTS IN TRUE SOLUTIONS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation of Ser. No. 940,355, Sep. 7, 1978, abandoned, which is a division of Ser. No. 833,905, Sep. 16, 1977, Pat. No. 4,151,311, which is a continuation-in-part of Ser. No. 651,507, Jan. 22, 1976, abandoned. This application Apr. 28, 1980, Ser. No. 144,428

Int. Cl.[3] C23C *3/02*

U.S. Cl. 427—304 14 Claims

1. A process for the electroless metal deposition onto a non-conductor comprising:

(1) contacting said non-conductor with a catalytic solution comprising the admixture of a principal catalytic agent wherein said principal catalytic agent is a compound of a metal selected from the group of metals consisting of copper, nickel, cobalt, and iron and mixtures thereof and a catalytic promoter agent wherein said catalytic promoter agent is a compound of a metal selected from the group of metals consisting of Mg, Ca, Sr, Sc, Y, La, Ti, Zr, Hf, Nb, Ta, Cr, Mn, Tc and Re and mixtures thereof and further wherein the concentrations for the principal catalytic agent and the catalytic promoter agent are so adjusted as to yield a catalytic solution having a greater catalytic activity for electroless metal deposition in comparison to the same catalytic solution in the absence of said catalytic promoter agent, and

(2) contacting the treated non-conductor with an electroless metal deposition bath.

4,297,398

MANUFACTURING COATED STEEL STRIP

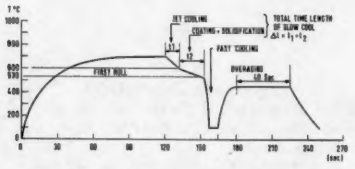
Philippe Paulus, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie

Filed Mar. 3, 1980, Ser. No. 126,387

Claims priority, application Belgium, Nov. 2, 1979, 874599

Int. Cl.[3] C23C *1/02, 1/08*

U.S. Cl. 427—320 9 Claims



1. A method of manufacturing coated steel strips comprising the sequential steps of:

heating the strip to a temperature higher than its recrystallization temperature,

holding the strip at this temperature,

cooling the strip to a temperature now lower than that of a subsequent bath in a preliminary cooling stage,

immersing the strip in a molten metal bath maintained at a temperature higher than 500° C., the molten metal having a melting point lower than 800° C.,

cooling the strip until the metal coating has solidified in a first cooling stage, and

subjecting the strip immediately thereafter to a more intense and more rapid second cooling stage which does not impair the flatness of the strips to a temperature lower than 475° C. by quenching the strip in an aqueous bath held at a temperature higher than 75° C.,

followed by more slowly cooling the strip to ambient temperature;

with the proviso that the period of time between the beginning of the preliminary cooling stage and the beginning of the second cooling stage is not shorter than 20 seconds and not longer than 100 seconds.

4,297,399

METHOD FOR CURING CONCRETE

John S. Perz, Mentor, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Jan. 8, 1980, Ser. No. 110,294

Int. Cl.[3] B05D *1/00*

U.S. Cl. 427—385.5 9 Claims

1. A method for curing concrete comprising applying to the surface of the concrete, as a curing compound, a composition comprising Singapore dammar resin and an organic solvent for said resin.

4,297,400

PROCESS FOR IMPARTING TO TEXTILE MATERIALS A SOFT HANDLE USING UNSATURATED ALIPHATIC ACID AMIDES

Jörg Kern, Waldkraiburg, Fed. Rep. of Germany, and Christian Guth, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 8, 1979, Ser. No. 64,659

Claims priority, application Switzerland, Aug. 18, 1978, 8788/78

Int. Cl.[3] B05D *3/02*

U.S. Cl. 427—389 12 Claims

1. A process for imparting to a textile material a soft handle, which process comprises immersing the material at 20° to 100° C. for 5 to 120 minutes in an aqueous preparation containing an acid amide of the formula

$$CH_2=C(X)—CO—NH—R_1$$

or a reaction product from acrylic or methacrylic acid, or an alkyl ester thereof, and an amine of the formula

$$R_1—NH_2$$

wherein R_1 is alkyl or alkenyl of 14 to 22 carbon atoms and X is hydrogen or methyl, and subsequently drying the material at 50° to 150° C.

4,297,401

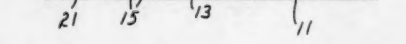
LIQUID CRYSTAL DISPLAY AND PHOTOPOLYMERIZABLE SEALANT THEREFOR

Mao-Jin Chern, Woodbury, and Robert D. Lowrey, White Bear Lake, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Dec. 26, 1978, Ser. No. 973,149

Int. Cl.[3] B32B *17/10;* C09K *3/34*

U.S. Cl. 428—1 11 Claims



1. An improved liquid crystal display cell comprising a pair of half-cells having portions thereof bonded together by organic seal means wherein the improvement comprises an organic seal means comprising a photopolymerized sealant comprising a polymerized mixture of:

(a) cationically polymerizable epoxide with a functionality of at least 1, and;

(b) an organic aromatic onium catalyst comprising an aromatic adduct of

(1) a diaromatic, triaromatic, or tetraaromatic organoatomic cation of a Group Va, VIa, or VIIa atom and

(2) an anion; said onium catalyst being represented by the formula:

$$(R^2)_n—A^+C^-$$
$$\vert$$
$$(R^1)_a$$

wherein

R^2 is an aromatic group at least as electron withdrawing as benzene,

R^1 is an alkyl or alkenyl group,

A is a Group Va, VIa, or VIIa atom,

X is an anion,

n is a positive whole integer of at least 2 up to the valence of A plus one,

a is 0 or a positive whole integer up to the valence of A minus one, and

n plus a is equal to the valence of A plus one and wherein at let two of said R^2 groups are bonded to A;

said photopolymerized sealant being chemically resistant to liquid crystal materials.

4,297,402

PACKAGING BAG

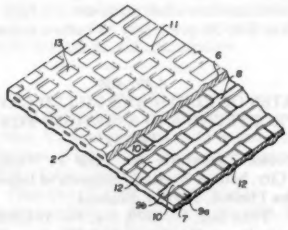
Koichi Kinbara; Norimaro Sugimoto, both of Kawasaki, and Toshitaka Nakazawa, Kure, all of Japan, assignors to Meito Co. Ltd. and Toyo Pulp Co. Ltd., both of Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,580

Claims priority, application Japan, Apr. 21, 1979, 54-53536[U]; May 8, 1979, 54-60911[U]

Int. Cl.³ B65D *33/02;* **B32B** *3/30, 5/12, 7/04*

U.S. Cl. 428—35 **5 Claims**



1. A packaging bag fabricated by a reinforced sheet in which a non-woven cross-linked plastic sheet of split films with narrow width crossing each other is inserted between combination cellulose papers in a manner that the intersections of the split films of the non-woven plastic sheet are presented at least on one side surface of the sheet in protruded pattern.

4,297,403

CORELESS PRESSURE SENSITIVE LABEL SUPPLY ROLL

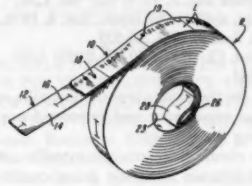
Thomas M. Smith, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 6, 1980, Ser. No. 119,123

Int. Cl.³ B32B *3/16, 7/06*

U.S. Cl. 428—42 **9 Claims**

1. A coreless pressure sensitive label supply roll comprising a series of pressure sensitive labels releasably bonded by pressure sensitive adhesive to a releasable surface of an elongated carrier web, the assembly of the carrier web and labels being wound into a supply roll adapted to be used in a label printing and applicating device where the labels are successively printed and then successively peeled from the carrier web, the carrier web having an inner convolution defining a center opening, the inner convolution of the carrier web having a folded end portion forming a first end section extending from



and folded back over a radially underlying second end section, and means connecting the first end section of the carrier web to a radially overlying portion of the carrier web to provide the carrier web with a connected loop forming the inner end of the carrier web.

4,297,404

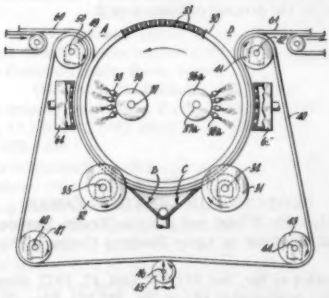
NON-WOVEN FABRIC COMPRISING BUDS AND BUNDLES CONNECTED BY HIGHLY ENTANGLED FIBROUS AREAS AND METHODS OF MANUFACTURING THE SAME

Hien V. Nguyen, East Windsor, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 31,086, Apr. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 806,033, Jun. 13, 1977, abandoned. This application Jan. 9, 1980, Ser. No. 110,719

Int. Cl.³ D04H *1/46, 1/70*

U.S. Cl. 428—85 **11 Claims**



1. A non-woven fabric with a plurality of patterns of groups of fiber segments that alternate and extend throughout the fabric which comprises: groups of fiber segments in discontinuous portions of the fabric, said discontinuous portions forming a first pattern, each of said groups including at least one nub of fiber segments interentangled in helter-skelter arrangement, said nub protruding out of the plane of the fabric, each of said groups also including at least one yarn-like bundle of fiber segments wherein the fiber segments are in close proximity and substantial parallelism to one another, said first discontinuous portions of the fabric being bound and interconnected by a continuous highly entangled, interlaced fibrous area, said continuous portion forming a second pattern and the fibers in said continuous portion being entangled in substantially all directions including the thickness of the fabric, said fabric having a bulk density of from 0.04 grams per cubic centimeter to 0.084 grams per cubic centimeter and a tenacity of at least 0.5 pounds per inch per 100 grains per square yard.

4,297,405

CORROSION RESISTANT METALLIC ARTICLE HAVING A MATT NACREOUS APPEARANCE

Nobuyoshi Kasahara, Sayama, and Koutaro Nonomura, Kunitachi, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,347

Claims priority, application Japan, Jan. 9, 1978, 53-537; Jan. 9, 1978, 53-538; Jan. 9, 1978, 53-539

Int. Cl.[3] B32B *19/02;* B05D *5/02*

U.S. Cl. 428—141 9 Claims

1. A process for the production of a metallic article having a matt nacreous appearance and improved corrosion resistance, comprising the steps of:

subjecting to chemical treatment a metallic substrate made of a metal selected from the group consisting of zinc, aluminum, magnesium and alloys thereof as white-silvery metals to form a substantially colorless transparent film having improved corrosion resistance on the surface of the metallic substrate,

coating the corrosion resistant film-covered metallic substrate with a clear paint comprising a nacreous pigment in fine flaky form having a colorless and transparent appearance by spraying the paint to the corrosion resistant film at a lower feeding rate than that necessary for arranging the flaky pigment in substantially lamellate form and a spraying air pressure generally higher than that necessary therefor, the nacreous pigment being a nacreous compound selected from the group consisting of (1) oxides and salts of elements of Groups IV and V of the Periodic Table and (2) composite composed of mica and said nacreous compound coated thereon, to form a coating having a finely undulated surface on said corrosion resistant film and then

drying the thus formed clear paint coating having the finely undulated surface on the film-covered metallic substrate to produce the metallic article.

9. A metallic article having a light reflectivity of 30–60% produced by the process of claim 1 or 2.

4,297,406

PRODUCT FOR TREATING FABRIC

John L. Metcalfe, Wirral, and Douglas Wraige, Newton, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 842,827, Oct. 17, 1977, abandoned, which is a continuation of Ser. No. 782,191, Mar. 28, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,650

Claims priority, application United Kingdom, Mar. 30, 1976, 12832/76

Int. Cl.[3] B32B *7/02, 3/26*

U.S. Cl. 428—215 9 Claims

1. A fabric treating product comprising:

(a) a first and second outer layer of resiliently flexible foamed polymer substrate having a relatively dense structure; laminated to;

(b) an inner layer of resiliently flexible foamed polymer substrate having a relatively less dense structure and being positioned between said first and second outer layers; and

(c) a fabric conditioning agent impregnated into said inner layer and said first and second outer layers.

2. A fabric treatment product according to claim 1, wherein said first and second outer layers and said inner layer are in sheet form, said first and second outer layers each have a thickness of from about 0.5 mm to about 4 mm and the overall thickness of the product is from about 0.2 cm to about 2.5 cm.

4,297,407

FINISH COMPOSITION FOR THE SPINNING OF HIGHLY CRIMPED CELLULOSE FIBERS USING A COMPOSITION CONT. FATTY ACID ESTER, ORGANIC PHOSPHORIC ACID ESTER, FATTY ACID ETHYLENE OXIDE COND. PROD. AND FATTY ACID SALT

Francesco Manca, Milan, Italy, assignor to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed May 31, 1979, Ser. No. 44,103

Claims priority, application Italy, Jun. 5, 1978, 24224 A/78

Int. Cl.[3] D06M *13/26, 13/32, 13/18;* D03D *3/00*

U.S. Cl. 428—224 30 Claims

1. A composition adapted to facilitate the cotton type spinning of highly crimped cellulosic fibers comprising the following components:

(A) from 10 to 30%, by weight of at least one compound having the formula:

wherein R and R′, equal to or different from one another are straight or branched chain alkyl radicals, comprising all together 8 to 40 carbon atoms;

(B) from 8 to 15%, by weight of at least an organic ester of phosphoric acid, wherein only a part of the acid groups have been esterified, the remaining acid groups being free or salified, said ester being in the form of a monomer or a polymer;

(C) from 50 to 70%, by weight of at least one product obtained by the condensation of fatty acids with alkylene oxide or polyalkyleneglycols, wherein the alkylene moiety contains 2 or 3 carbon atoms;

(D) up to 0.5% by weight of organic or inorganic alkali metal salts having a high solubility in water;

and

(E) the amount required to make up 100% of an composition, of at least one alkali metal salt of a fatty acid containing from 6 to 20, preferably 18 carbon atoms.

4,297,408

LAMINATES OF CLOTH AND FILLED CRYSTALLINE POLYPROPYLENE AND A METHOD FOR MAKING THEM

John C. Stead, Knebworth, and Peter E. Waghorn, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 17, 1979, Ser. No. 104,058

Claims priority, application United Kingdom, Dec. 29, 1978, 50242/78

Int. Cl.[3] B32B *27/12, 27/20, 27/32, 31/08*

U.S. Cl. 428—240 5 Claims

1. A laminate comprising cloth or other sheet material and a layer of a filled crystalline polypropylene composition containing 20 to 80% by weight of a particulate filler wherein the cloth or other sheet material is adhered to a surface of the layer of filled polypropylene composition by means of a layer of unfilled random copolymer of propylene with up to 10% (by weight of the copolymer) of ethylene interposed between the cloth or other sheet material and said surface.

3. A method for making a laminate as claimed in claim 1 wherein the method comprises:

(a) heating the filled and unfilled polypropylene compositions to temperatures above the crystalline melting points of their polypropylenes,

(b) contacting a surface of the filled composition with a surface of the unfilled composition before, during or after heating,

(c) contacting the cloth or other sheet material with another surface of the unfilled composition under conditions of

temperature and pressure such that some unfilled composition flows into the cloth or into intimate contact with the other sheet material and then

(d) cooling the filled and unfilled compositions to below their crystalline melting points whereupon the unfilled composition bonds the cloth or other sheet material to the filled composition to form the laminate.

4,297,409

MANUFACTURE OF ARTICLES FROM AN ORGANIC MATERIAL AND A WATER-HARDENABLE MASS

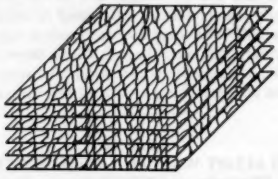
David J. Hannaht, Great Bookham, England, assignor to University of Surrey, Surrey, England, a part interest

Continuation-in-part of Ser. No. 30,428, Apr. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 809,394, Jun. 23, 1977, abandoned. This application Nov. 6, 1979, Ser. No. 92,416

Claims priority, application United Kingdom, Jul. 1, 1976, 27371/76

Int. Cl.[3] B32B 7/00

U.S. Cl. 428—247 33 Claims



1. An article comprising a water-hardened mass and a continuous network of fabrillated film in the form of a plurality of layers embedded in the water-hardened mass, the volume of film amounting to more than 1½% by volume of the overall volume of the article and the fibrils of said film providing continuous mechanical and frictional bonding to reinforce the water-hardened mass so that under excess loading the article exhibits multiple fine cracks without rupture.

4,297,410

ABSORBENT MATERIAL

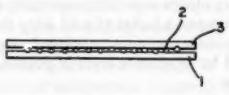
Yoshimi Tsuchiya, Utsunomiya; Masayuki Sagae, Tochigi, and Hiroshi Mizutani, Yachiyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1979, Ser. No. 81,234

Claims priority, application Japan, Oct. 12, 1978, 53-140165

Int. Cl.[3] B32B 5/16

U.S. Cl. 428—283 7 Claims



1. An absorbent material consisting essentially of: a first, non-woven fabric, absorbent sheet consisting essentially of absorbent fibers capable of absorbing exudations from the human body and from 10 to 50% by weight of thermoplastic polyolefin fibers; a multitude of particles deposited on one surface of said first sheet so as to form a discrete layer of said particles on said one surface of said first sheet wherein said particles project upwardly above said one surface of said first sheet, said particles consisting essentially of hydrophilic polymeric substance capable of absorbing water in an amount at least 30 times the weight of said hydrophilic polymeric substance, said particles being meltadhered to said thermoplastic polyolefin fibers of said first sheet at the locations where said particles contact said thermoplastic polyolefin fibers, said absorbent material having been prepared by depositing said particles on said sheet and then heating said sheet to melt thermoplastic polyolefin fibers therein whereby to cause said particles to adhere to said thermoplastic polyolefin fibers.

4,297,411

HEAT SEALABLE PACKAGING FILM COMPRISING PROPYLENE POLYMER SUBSTRATE AND A SURFACE LAYER OF AN ETHYLENE COPOLYMER AND A DIFFERENT OLEFIN COPOLYMER

Milton L. Weiner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 5, 1979, Ser. No. 82,360

Int. Cl.[3] C09J 7/02; B32B 27/08

U.S. Cl. 428—347 9 Claims

1. A multiple-layer, heat-sealable film comprising

(a) a substrate layer consisting essentially of a homopolymer of polypropylene, a copolymer of polypropylene, or a blend of said homopolymer or copolymer containing up to 40% by weight of a different compatible polyolefin or polyolefin blend; and

(b) on at least one of the surfaces of the substrate layer, a surface layer comprising a blend of 5–95 weight percent of a copolymer of ethylene (10–75 mole percent) and a higher olefin having 4 or more carbon atoms (90–25 mole percent), and 95–5 weight percent of a different copolymer of an alpha olefin having 2 or more carbon atoms (2–98 mole percent) and a different higher olefin having 3 or more carbon atoms (98–2 mole percent);

4,297,412

TWO-COMPONENT MIXED ACRYLIC FIBRES WHEREIN ACRYLIC COMPONENTS HAVE DIFFERENT AMOUNTS OF NON-IONIZABLE PLASTICIZING COMONOMER

Georges Achard, Decines; Pierre Chion, Bron, and Jacques Menault, Charbonnieres-les-Bains, all of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Nov. 28, 1979, Ser. No. 97,954

Claims priority, application France, Nov. 30, 1978, 78 34054

Int. Cl.[3] B32B 27/02; D01F 8/08; D02G 1/18, 3/00

U.S. Cl. 428—370 6 Claims

1. Two-component mixed acrylic composite fibres and yarns with a natural crimp, suitable for carding, stretch breaking and converting said fibers consisting of a mixture of monolaminar, bilaminar and multilaminar strands and made of two polymers A and B, polymer A comprising at least 83% by weight of acrylonitrile, 4 to 15% by weight of a non-ionisable plasticising comonomer, and up to 2% by weight of an acid comonomer which is copolymerisable with acrylonitrile, and polymer B comprising at least 94% by weight of acrylonitrile, 0 to 4% by weight of a non-ionisable plasticising comonomer and up to 2% by weight of an acid comonomer which is copolymerisable with acrylonitrile, the difference in the proportion of plasticising comonomer in the polymers A and B being between 4 and 15% by weight and the total number of milliequivalents of acid in the two polymers being at least 50 per kg of polymer, the said composite fibres and yarns possessing a three-dimensional crimp, the direction of which depends on the heat and/or mechanical treatments to which the composite fibres or yarns have been subjected, polymer B being located on the inside of the helix formed by strands which have been subjected, without tension, to a temperature below about 110° C. and at least equal to ambient temperatures (crimp C 1), and being located on the outside of the helix formed by strands which have been subjected to tension and/or heat treatment at a temperature above about 110° C. (crimp C 2), the contraction and frequency of the two types of crimp varying from one strand to the next and along the length of one strand.

4,297,413

CONCENTRIC COMPOSITE CONJUGATE YARNS AND A PROCESS FOR MANUFACTURING SAME

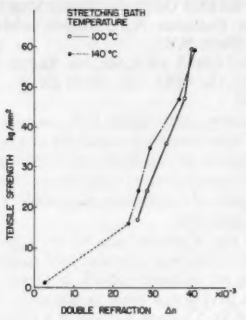
Tohru Sasaki; Hiroyuki Endoh, and Hiroshi Ohhira, all of Iwaki, Japan, assignors to Kureha Kugaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 928,301, Jul. 26, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 143,145

Claims priority, application Japan, Jul. 27, 1977, 52-89197

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—394 **8 Claims**



1. A concentric stretched conjugated yarn having

(A) A polyefin core component which is initially pre-stretched to have a double refraction index of from 10×25^{-3} to 25×10^{-3}, and

(B) A concentric sheath component which is a polyamide or polyester fused resin and which is initially unoriented,

with the proviso that the conjugated yarn is stretched until the double refraction index of the polyolefin core component is at least 30×10^{-3}.

4,297,414

REINFORCING MATERIAL FOR HYDRAULIC SUBSTANCES AND METHOD FOR THE PRODUCTION THEREOF

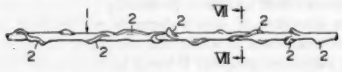
Hisashi Matsumoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 25, 1979, Ser. No. 51,387

Claims priority, application Japan, Jul. 7, 1978, 53-81917; Jul. 17, 1978, 53-86182; Dec. 20, 1978, 53-160804

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—400 **15 Claims**



1. Reinforcing material for hydraulic substances, which consists essentially of an elongated, stretched product of a synthetic resin, the product having a thickness of 3000 denier to 12,000 denier and having discontinuous protrusions over its entire length, the height of the protrusions being not less than 0.1 mm.

4,297,415

HEAT-SEALABLE POLYPROPYLENE FILMS

Herbert J. Ward, Bristol; Derek J. Dobbie, and Brian Lyall, both of Bridgwater, all of England, assignors to British Cellophane Limited, Somerset, England

Filed Aug. 23, 1979, Ser. No. 69,091

Claims priority, application United Kingdom, Sep. 6, 1978, 35846/78

Int. Cl.³ B32B *27/32, 31/14*

U.S. Cl. 428—516 **9 Claims**

1. A heat-sealable oriented polypropylene film comprising a base film of oriented polypropylene film having on one surface a layer of a random propylene/ethylene copolymer in which the ethylene content lies in the range between 2% and 6% by weight and on the other surface a predominantly linear random copolymer of ethylene and between 6% and 40% by weight of the random copolymer of at least one further alpha olefin having at least three carbon atoms per molecule.

5. A method of the manufacture of a heat-sealable oriented polypropylene film comprising applying to one surface of a base polypropylene film a layer of a random propylene/ethylene copolymer in which the ethylene content lies in the range between 2% and 6% by weight and to the other surface a predominantly linear random copolymer of ethylene and between 6% and 40% by weight of the random copolymer of at least one further alpha olefin having at least three carbon atoms per molecule, bringing the combination to a stretch orientatable condition and stretching in at least one direction.

4,297,416

GOLD ALLOY WIRE FOR JEWELRY CHAINS

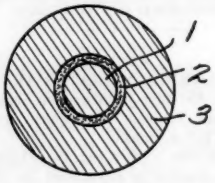
Hans Krug, Pforzheim, and Kurt Heilmann, Eisingen, both of Fed. Rep. of Germany, assignors to Ferd. Wagner, Pforzheim, Fed. Rep. of Germany

Filed Jun. 13, 1979, Ser. No. 48,586

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829284

Int. Cl.³ B23K *35/22, 35/30, 35/00*

U.S. Cl. 428—576 **6 Claims**



1. In a gold alloy wire suitable for the production of jewelry, especially jewelry chains consisting essentially of a gold solder containing nucleus and a jacket of gold alloy the improvement comprising said solder containing nucleus having a core of fine gold surrounded by an ajacent layer of ductile, lower melting gold solder alloy.

4,297,417

PHOTOSENSITIVE COLORED GLASSES EXHIBITING ALTERABLE PHOTO-ANISOTROPIC EFFECTS

Che-Kuang Wu, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

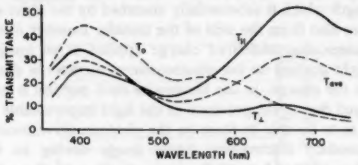
Division of Ser. No. 924,508, Jul. 14, 1978, Pat. No. 4,191,547. This application Oct. 19, 1979, Ser. No. 86,589

Int. Cl.³ B32B *17/00;* G02F *3/00*

U.S. Cl. 428—410 **2 Claims**

2. A photosensitive optical information storage medium for storing optical information utilizing photo-anisotropic effects comprising a photosensitive colored glass article exhibiting alterable photo-anisotropic effects consisting of a body portion

and an integral hydrated surface layer of a thickness of about 1–500 microns having Ag-AgCl-containing crystals therein, at least a portion of which exhibits photo-dichroic and birefringent properties when exposed to colored, linearly polarized bleaching light, said body portion consisting essentially, in mole percent on the oxide basis, of about 70–82% SiO_2,



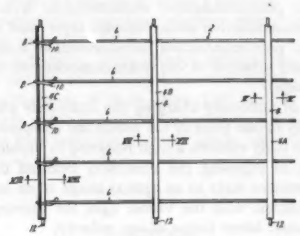
10–17% Na_2O and/or K_2O, 5–15% ZnO, 0.5–5% Al_2O_3, and 0.1–3% Cl, said surface layer containing about 1–8% by weight H_2O and about 2–20% by weight Ag, the proportion of Na^+ and/or K^+ ions in said surface layer being less with a corresponding increase in Ag^+ ions, and the Ag portion of said crystals is present as a layer on the surface of the crystals and/or is contained within said crystals.

4,297,418

COMPONENT STRAND FOR WIRE FABRICS

Harmon W. Arnold, and Galen B. Erwin, both of Carthage, Mo., assignors to Flex-o-lators, Inc., Carthage, Mo.

Filed May 29, 1979, Ser. No. 43,112
Int. Cl.³ B21F *33/00*
U.S. Cl. 428—595 **5 Claims**



1. A wire fabric formed of a plurality of component strands extending in generally parallel, spaced apart relation, and a plurality of cross wires extending transversely to said component strands in generally parallel, spaced apart relation, each of said cross wires being attached to each of said component strands at its point of intersection therewith by piercing said strand, at least one of said component strands comprising:

a. a longitudinally extending core wire, and

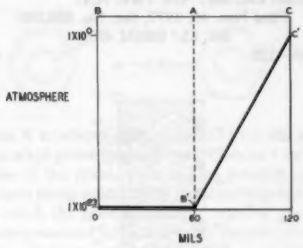
b. a longitudinally extending sheath in which said core wire is embedded said sheath being formed of a relatively soft, flexible and piercable material, and having its external surface formed to present at least a pair of diametrically opposite, longitudinally extending grooves to configurate said strand cross-sectionally to form a pair of enlarged heads connected by a neck of reduced thickness, said cross wires piercing said neck, said core wire being embedded in one of the heads of said sheath, offset from the neck thereof, whereby not to interfere with the piercing of said neck by said cross wires.

4,297,419

ANODE-MATRIX COMPOSITE FOR MOLTEN CARBONATE FUEL CELL

Richard C. Nickols, Jr.; John C. Trocciola, both of Glastonbury, Conn., and James E. Rourke, East Windsor, N.J., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 24, 1980, Ser. No. 189,888
Int. Cl.³ H01M *4/86*
U.S. Cl. 429—44 **10 Claims**



5. A molten carbonate fuel cell anode-matrix composite comprising an alkali metal carbonate impregnated cerium oxide substrate having adjacent sections of greater and lesser pore sizes, the section of greater pore size being electron conductive and anode catalytic under molten carbonate fuel cell operating conditions, and the section of lesser pore size being substantially non-catalytic and non-electron-conductive under molten carbonate fuel cell operating conditions.

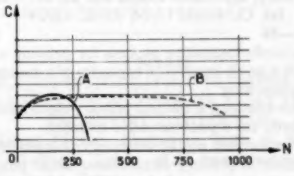
6. A molten carbonate fuel cell comprising an anode matrix composite comprising an alkali metal carbonate impregnated cerium oxide substrate having adjacent sections of greater and lesser pore sizes, the section of greater pore size being electron conductive and anode catalytic under molten carbonate fuel cell operating conditions and the section of lesser porosity being substantially non-catalytic and non-conductive under molten carbonate fuel cell operating conditions, and a cathode electrode in contact with the anode-matrix composite on the matrix side of the composite.

4,297,420

ELECTRODE FOR A LEAD ACCUMULATOR

Bernard Chenaux, Paris, and Alain Leroux, St-Cheron, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Continuation of Ser. No. 86,447, Oct. 19, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,401
Claims priority, application France, Oct. 27, 1978, 78 30591
Int. Cl.³ H01M *4/62*
U.S. Cl. 429—217 **3 Claims**



1. An electrode for a lead accumulator of the type which includes an electronically conductive core coated with an active material which contains grains of lead monoxide, lead sulphate and a binding agent which is suitable for forming a three-dimensional network of fibres, wherein said electrode further includes a material which is insoluble in sulphuric acid, is permeable to conductivity ions and forming a film over said

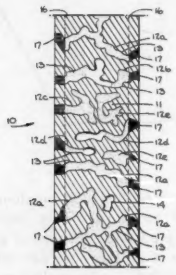
grains, the material being chosen from the group which includes polyacrylic acid and hydroxyethylmethacrylate and being used in a proportion by weight of 0.25 to 2% with respect to said lead monoxide.

4,297,421

BATTERY AND ELECTROLYTIC CELL ELECTRODES

Pierre P. Turillon, Ramsey, N.J.; Michael N. Hull, and George F. Nordblom, both of Yardley, Pa., assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,290
Int. Cl.³ H01M *4/56*
U.S. Cl. 429—225 **62 Claims**



1. An article of manufacture, adapted to be used with an electrolyte such that when in use at least part of one surface of said article is exposed to said electrolyte and, at least part of the time, is at an oxidizing potential comprising, at least adjacent said at least part of one surface, a matrix of a metal anodically passivated in said electrolyte at said oxidizing potential containing a maze of tortuous paths essentially filled adjacent said at least part of one surface with an electroconductive oxide essentially insoluble in said electrolyte and the remainder of said maze paths of said maze is filled with metal in direct contact with said electroconductive oxide, said oxide being confined by the walls of said paths, essentially blocking entry of said electrolyte to the interior of said matrix thereby maintaining the electrolyte-article interface at the external surface of the article and providing a means of electrical conductivity at said oxidizing potential between said electrolyte and the interior of said article.

4,297,422

ELECTROPHOTOGRAPHIC PROCESS FOR PRINTING A PLURALITY OF COPIES

Eiichi Sato, Tama, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,693
Claims priority, application Japan, Jul. 21, 1977, 52-87556
Int. Cl.³ G03G *13/16, 13/22, 13/24*
U.S. Cl. 430—54 **14 Claims**

1. An electrophotosensitive process for printing a plurality of copies with a single imagewise exposure of a document to be duplicated comprising

(a) a step for effecting a uniform primary electrification with one polarity for a photosensitive member;

(b) a step for forming on the uniformly charged photosensitive member a primary electrostatic latent image corresponding to an image of the document by effecting the imagewise exposure;

(c) a step for developing the primary latent image with toner developer having charged in the other polarity to form on the photosensitive member a toner image;

(d) a step for placing a transparent or translucent transfer member over a surface of the photosensitive member on which surface the toned image has been formed;

(e) a step for effecting a secondary electrification with the one polarity by applying a transferring electric field from the side of the transfer member in such a manner that a potential at an imagewise dark portion on the photosensitive member on which portion the toner has been applied will assume a substantially same potential as that of the primary electrostatic latent image after a transfer and for effecting a secondary exposure with light having a wavelength which is substantially absorbed by the toner developer also from the side of the transfer member in such a manner that undesired charge applied at an imagewise bright portion on the photosensitive member is decayed, but the charge on the imagewise dark portion is not decayed due to the presence of the light impermeable toner so as to be able to form on the photosensitive member a secondary electrostatic latent image having an image information substantially corresponding to the primary latent image after the transfer, said secondary electrification and secondary exposure being simultaneously or successively effected, while the transfer member is placed over the photosensitive member; and

(f) a step for separating the transfer member from the photosensitive member to transfer the toner image onto the transfer member;

whereby the steps (c) to (f) are repeated successively for the secondary latent image repeatedly formed on the photosensitive member to form a number of duplicated copies.

4,297,423

ELECTROPHOTOGRAPHIC PROCESS FOR MULTIPLE IMAGES

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,358
Claims priority, application Japan, Nov. 30, 1977, 52-142691
Int. Cl.³ G03G *13/16, 13/22*
U.S. Cl. 430—54 **3 Claims**

1. An electrophotographic process using a composite photosensitive body which has an electrically conductive substrate, an inorganic photoconductive semiconductor layer and an organic photoconductive semiconductor layer, said inorganic and organic photoconductive semiconductor layers being applied on said substrate in this order comprises the following successive steps:

(a) a step of uniformly charging the composite photosensitive body in one polarity for which the composite photosensitive body exhibits a high response to visible light;

(b) a step of exposing the uniformly charged composite photosensitive body to an optical image of an original to be duplicated with the visible light for forming a first electrostatic latent image of one polarity;

(c) a step of developing the first electrostatic latent image with toners which have been charged in the opposite polarity and are impermeable to ultraviolet rays to form a primary toner image;

(d) a step of uniformly charging the composite photosensitive body in the opposite polarity for which the composite photosensitive body exhibits a small dark decay;

(e) a step of exposing the composite photosensitive body to ultraviolet rays from the side of the primary toner image, to form a second electrostatic latent image of opposite polarity;

(f) a step of cleaning the primary toner image out of the composite photosensitive body;

(g) a step of developing the second electrostatic latent image of opposite polarity with toners charged in one polarity to form a secondary toner image;

(h) a step of transferring the secondary toner image onto a record sheet to form a duplicated copy; and

(i) a step of repeating successively said steps (h) and (i) to form a plurality of duplicated copies.

4,297,424
OVERCOATED PHOTORECEPTOR CONTAINING GOLD INJECTING LAYER

Harvey J. Hewitt, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1980, Ser. No. 127,174
Int. Cl.³ G03G 5/085, 5/14
U.S. Cl. 430—58 **1 Claim**

1. A layered inorganic photosensitive device which consists of

(a) a substrate;

(b) a layer of hole injecting material capable of injecting holes into a layer on its surface, this layer being comprised of gold, and having a thickness of from about 0.02 microns to about 10 microns;

(c) a hole transport layer in operative contact with the hole injecting layer, this layer being comprised of a halogen doped selenium-arsenic alloy wherein the percentage of selenium present by weight is from about 99.5 percent to about 99.9 percent, the percentage of arsenic present by weight is from about 0.5 percent to about 0.1 percent, and the halogen is present in an amount of from about 10 parts per million, to about 200 parts per million;

(d) a charge generating layer overcoated on the hole transport layer, consisting of an inorganic photoconductive material, the charge generating layer having a thickness of from about 0.1 micron to about 5 microns;

(e) an electrically insulating organic resin overlaying the charge generating layer; and

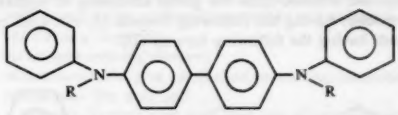
(f) a hole trapping layer situated between the generating layer and the overcoating layer, said trapping layer having a thickness of from about 0.05 microns to about 5 microns and being comprised of inorganic materials selected from selenium, selenium alloys, and halogen doped selenium arsenic alloys.

4,297,425
IMAGING MEMBER

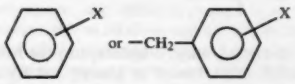
Damodar M. Pai, Fairport; John M. Pochan, and Darlyn F. Pochan, both of Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 78,264, Sep. 24, 1979, abandoned. This application Jun. 26, 1980, Ser. No. 163,256
Int. Cl.³ G03G 5/04, 5/14
U.S. Cl. 430—58 **5 Claims**

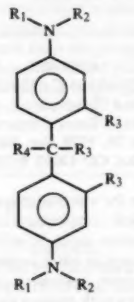
1. In an imaging member comprising a hole generation layer and a contiguous hole transport layer, said generation layer comprising a photoconductive material exhibiting the capability of photogeneration of holes and injection of said holes, said hole transport layer comprising a transparent electrically inactive polycarbonate resinous material having a residual amount within the range of from about 0.01 to about 1.0 percent by weight of said transport layer in said layer of a halogen-containing organic solvent therein, and dispersed in said layer from about 25 to about 75 percent by weight based on said transport layer composition of a charge transport compound within the scope of the following structural formula:



wherein R is



and wherein X is independently selected from the group consisting of an alkyl group having from 1 to about 4 carbon atoms and chlorine in the ortho, meta or para position, said charge transport layer being substantially nonabsorbing in the spectral region at which the photoconductive material generates and injects photogenerated holes but being capable of supporting the injection of photogenerated holes from said photoconductive material and transporting said holes through said charge transport layer, the improvement consisting of the inclusion in said transport layer of a stabilizing compound within the scope of the following structural formula:



wherein R_1 and R_2 are independently selected from the group consisting of a C_1–C_8 alkyl, aryl, alkaryl and aralkyl, where said aryl is a phenyl group or a condensed ring group, where the alkyl group of said alkaryl and aralkyl is a C_1–C_4 group, R_3 is independently selected from the group consisting of hydrogen and CH_3; and R_4 is the same as R_1 and R_2 or a disubstituted aminophenyl group wherein the substituents are independently selected from the group consisting of a C_1–C_8 alkyl, aryl, alkaryl and aralkyl as defined supra, said stabilizing compound being present in an amount sufficient to at least minimize the deleterious effects of ultraviolet radiation.

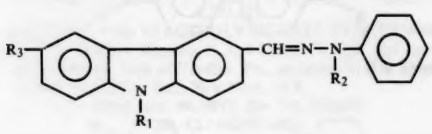
4,297,426
ELECTROPHOTOGRAPHIC ELEMENT WITH CARBAZOLE HYDRAZONE OR ANILE CHARGE TRANSPORT COMPOUNDS

Kiyoshi Sakai; Mitsuru Hashimoto, both of Numazu, and Tomiko Kawakami, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 21, 1980, Ser. No. 152,069
Claims priority, application Japan, May 28, 1979, 54-65741; May 28, 1979, 54-65742
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—59 **17 Claims**

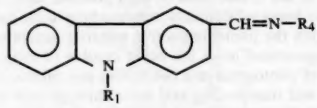
1. An electrophotographic element comprising: an electrically conductive substrate, a charge generation layer, a charge transport layer adjacent the charge generation layer, the

charge transport layer comprising at least one charge transport compound selected from the group consisting of hydrazone compounds having the following formula (I) and anile compounds having the following formula (II):



(I)

wherein R_1 is methyl, ethyl, 2-hydroxyethyl or 2-chloroethyl; R_2 is methyl, ethyl, benzyl or phenyl; and R_3 is chlorine, bromine, C_1–C_4 alkyl, C_1–C_4 alkoxy, dialkylamino in which the alkyl has 1 to 4 carbon atoms or nitro,



(II)

wherein R_1 has the same meaning as defined above, and R_4 is substituted phenyl, non-substituted phenyl, naphthyl, a heterocyclic group or C_1–C_{10} alkyl;
and a binder agent.

4,297,427

POLYBLEND COATED CARRIER MATERIALS

Meurig W. Williams, and Christopher J. AuClair, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1978, Ser. No. 872,518
Int. Cl.³ G03G *9/10*
U.S. Cl. 430—108 **9 Claims**

1. A carrier particle for electrostatographic developer mixtures, said carrier particle comprising a core having an average diameter of from between about 30 microns and about 1,000 microns, said core having an outer coating comprising a polyblend of a first polymer possessing negative triboelectric charging characteristics with respect to toner particles and a second polymer possessing strong adhesive properties with respect to said core, said first polymer comprising a fluoropolymer selected from the group consisting of polymers of vinylidene fluoride, tetrafluoroethylene, and fluorinated acrylates and methacrylates, and said second polymer being selected from the group consisting of polycaprolactone, polysulfones, polycarbonates, polyesters, polyamides, and polymers of styrene, alkyl acrylates, alkyl methacrylates, organosilanes, and acrylonitriles.

8. An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles, each of said carrier particles comprising a core having an average diameter of from between about 30 microns and about 1,000 microns, said core having an outer coating comprising a polyblend of a first polymer which comprises a halogenated polymer possessing negative triboelectric charging characteristics with respect to said toner particles and a second polymer which comprises an acrylic polymer possesssing strong adhesive properties with respect to said core, said first polymer comprising a fluoropolymer selected from the group consisting of polymers of vinylidene fluoride, tetrafluoroethylene, and fluorinated acrylates and methacrylates, and said second polymer being selected from the group consisting of polycarpolactone, polysulfones, polycarbonates, polyesters, polyamides, and polymers of styrene, alkyl acrylates, alkyl methacrylates, organosilanes, and acrylonitriles.

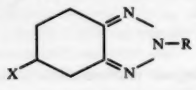
4,297,428

PROCESS FOR MAKING DIAZO PHOTOSENSITIVE PAPER

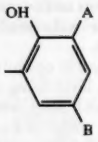
Kaneo Yamamoto, 4-1, Hirata-Kita-machi, Ashiya-shi, Hyogo-ken, Japan

Filed Mar. 26, 1980, Ser. No. 134,139
Claims priority, application Japan, Nov. 5, 1979, 54-141997
Int. Cl.³ G03C *1/86, 1/60*
U.S. Cl. 430—169 **6 Claims**

1. In a process for making an acid stabilized diazo photosensitive paper which comprises adding an ultraviolet absorber to an acid stabilized diazo photosensitve layer on a paper substrate, said layer consisting essentially of a diazonium salt and a coupler, the improvement wherein said ultraviolet absorber is a benzotriazole derivative represented by the general formula (1)



wherein R denotes



wherein each of A and B denotes H or an alkyl group having 1–5 carbon atoms and X denotes H or Cl, (a) mixing said ultraviolet absorber represented by the general formula (I) with a solvent selected from the group consisting of ethyl acetate, methyl acetate and methylethyl ketone, so as to prepare a 3–10% by weight solution of the ultraviolet absorber in the solvent, dispersing 10 parts of said solution in 15–20 parts of an aqueous solution containing 1–3% of sulfosuccinate and 0.1–1% of polyvinyl alcohol and evaporating the ethylacetate, methyl acetate or methylethyl ketone, therefrom, (b) mixing the thus-prepared solution with a photosensitive liquid consisting of diazonium compound and a coupler so that the amount of said ultraviolet absorber represented by said formula (I) contained therein is 15–50% of the amount of the coupler contained in the photosensitive liquid, and, (c) applying the photosensitive liquid containing the ultraviolet absorber to a paper substrate to prevent discoloration of the texture of a copy of said paper.

4,297,429

PHOTOGRAPHIC MATERIAL AND DIFFUSION TRANSFER PROCESSING SOLUTION FOR MAKING PRINTING PLATES AND METHOD FOR MAKING PRINTING PLATES

Eiji Kanada; Shoji Yamada, and Yasuo Tsubai, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,580
Claims priority, application Japan, Jun. 18, 1979, 54-76581; Jun. 28, 1979, 54-81831; Jul. 2, 1979, 54-83834; Jul. 4, 1979, 54-85743
Int. Cl.³ G03C *5/54*
U.S. Cl. 430—204 **26 Claims**

1. Method for making a lithographic printing plate which utilizes the transfer silver as ink receptive portions which is formed by silver complex diffusion transfer process from a lithographic printing plate material which comprises a support having thereon at least both silver halide emulsion layer and physical development nuclei layer by imagewise-exposure of

the silver halide emulsion layer and diffusion transfer development thereof with an alkaline processing solution, characterized in that diffusion transfer development processing is carried out in the presence of 2-mercaptobenzoic acid derivative.

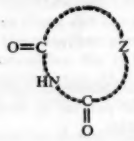
4,297,430

PHOTOGRAPHIC MATERIAL FOR PRODUCTION OF PRINTING PLATES AND METHOD FOR PRODUCTION OF PRINTING PLATES

Eiji Kanada; Shoji Yamada, and Yasuo Tsubai, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 142,822, Apr. 22, 1980, abandoned. This application Aug. 1, 1980, Ser. No. 174,696
Claims priority, application Japan, May 2, 1979, 54/54363
Int. Cl.³ G03C 5/54
U.S. Cl. 430—204 **11 Claims**

1. A method for producing a lithographic printing plate which comprises developing a photographic material exposed to light comprising a support having thereon at least both silver halide emulsion layer and surface physical development nuclei layer and having a thickness of 0.5μ or less by silver complex diffusion transfer process and utilizing transfer silver as ink receptive portions of printing plate, characterized in that the development is carried out in the presence of a cyclic imide compound having the general formula:



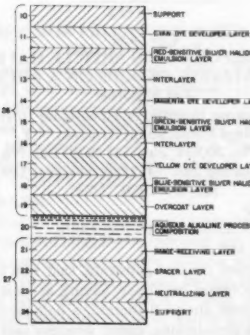
(wherein Z represents atoms of a series of completing a 5- or 6-membered cyclic imide nucleus which comprises from 1 to 3 nitrogen atoms and the remainder being carbon atoms and said atoms of Z may have substituent).

4,297,431

DIFFUSION CONTROL LAYERS IN DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS

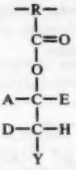
Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 942,490, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 774,599, Mar. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,140, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 487,228, Jul. 10, 1974, abandoned. This application Mar. 14, 1980, Ser. No. 130,532
Int. Cl.³ G03C 1/40, 1/76, 5/54, 1/48
U.S. Cl. 430—215 **78 Claims**



1. A photographic diffusion transfer film unit comprising:
a. a photosensitive element comprising at least a photosensitive silver halide emulsion layer having associated therewith a processing composition soluble and diffusible image-forming material;
b. an image-receiving element;
c. means for discharging an alkaline processing composition within said film unit; and
d. a diffusion control layer in at least one of said photosensitive element or said image-receiving element;

said diffusion control layer comprising a polymerization product of a monomer capable of undergoing β-elimination in an alkaline environment, said diffusion control layer being substantially impermeable to alkali or material soluble in or solubilized by said alkaline processing composition until said β-elimination, said polymerization product comprising recurring units of the formula



wherein

R is the addition polymerization product of an ethylenically unsaturated alkyl group of two or three carbon atoms;

A, D and E are selected from the group consisting of hydrogen, methyl and phenyl provided that no more than one of A, E, or D may be methyl or phenyl; and

Y is an activating group.

4,297,432

TWO-SHEET DIFFUSION TRANSFER ASSEMBLAGES AND PHOTOGRAPHIC ELEMENTS

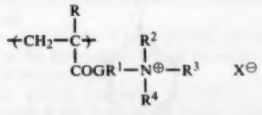
Wayne A. Bowman; John F. Bishop, and John M. Noonan, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,405
Int. Cl.³ G03C 5/54, 7/00, 1/40
U.S. Cl. 430—215 **21 Claims**

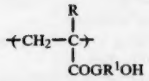
1. In a photographic element comprising a support having thereon, in order, a neutralizing layer, a timing layer and at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material,

the improvement wherein a layer of a vinylidene chloride polymer is present between said timing layer and said emulsion layer, and a co-extensive polymeric primer layer is present between said vinylidene chloride polymeric layer and said silver halide emulsion layer, said primer layer comprising:

(A) an ionic vinyl polymer comprising 10 to 30 weight percent of recurring units which conform to the structure:



and 70 to 90 weight percent of recurring units which conform to the structure:



wherein:
each R is independently hydrogen or methyl;
each R^1 is independently a straight or branched chain alkylene group of 1 to about 6 carbon atoms;
R^2, R^3 and R^4 are each an alkyl group of 1 to about 4 carbon atoms;
each G is independently oxygen or NH; and
X^- is an acid anion; or

(B) a ionic polyester comprising recurring units of:

(I) a diol component which comprises:

(a) at least 50 mole percent of units derived from diols having the structures:

(i)

wherein n is an integer of from 1 to 4; and

(ii) $O—R^6O—_m$, wherein m is an integer of from 2 to 4, and R^6 is an alkylene group of 2 to about 4 carbon atoms; and

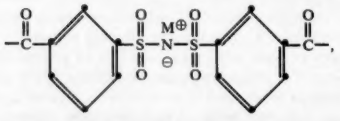
(b) 0 to 50 mole percent of units derived from one or more diols having the structure:

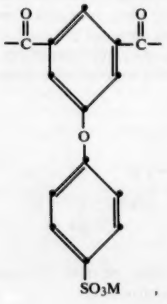
$—O—R^7—O—$

wherein R^7 is an alkylene group of up to about 16 carbon atoms, a cycloalkylene group of 6 to about 20 carbon atoms, a cycloalkylenebisalkylene group of 8 to about 20 carbon atoms, an arylenebisalkylene group of 8 to about 20 carbon atoms, or an arylene group of 6 to about 12 carbon atoms; and

(II) an acid component which comprises:

(a) 8 to 30 mole percent of units derived from one or more ionic dicarboxylic acids, said units having the structures:





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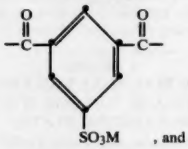
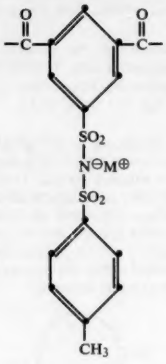


, and



wherein M is ammonium or a monovalent metal; and

(b) 70 to 92 mole percent of recurring units derived from other diacids.

4,297,433

LIGHT SENSITIVE COMPOSITIONS OF POLYMETHYL ISOPROPENYL KETONE

Minoru Tsuda, Isehara, and Yoichi Nakamura, Samukawa, both of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 957,836, Nov. 6, 1978. This application Nov. 16, 1978, Ser. No. 961,120

Claims priority, application Japan, Nov. 4, 1977, 52-132234

Int. Cl.[3] **G03C** *1/68, 5/00*

U.S. Cl. 430—270 **1 Claim**

1. An ultraviolet ray-sensitive composition comprising polymethyl isopropenyl ketone having a molecular weight of 10,000–1,000,000 and a dispersity index of below 3 and 4,4'-dibromobenzophenone, the amount of the benzophenone being 1–25 parts by weight per 100 parts by weight of the polymethyl isopropenyl ketone.

4,297,434

PHOTODEFORMABLE ARTICLE HAVING PHOTOIONIZABLE GROUPS ON A POLYMER BACKBONE

Ari Aviram, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 50,931, Jun. 21, 1979, Pat. No. 4,247,622. This application Jun. 13, 1980, Ser. No. 159,098

Int. Cl.[3] **G03C** *1/68*

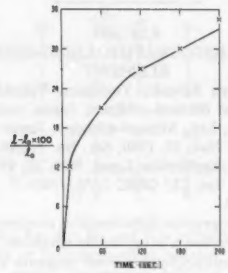
U.S. Cl. 430—270 **2 Claims**

1. A photodeformable article comprising

(a) a substrate, and

(b) a film disposed on said substrate, said film being composed of a polymer backbone having at least one photoionizable group attached thereto, a halogenated hydrocarbon and a crosslinking agent, wherein said polymeric backbone is selected from the group consisting of polyacrylics, polyglutamate, polyvinyl amines, polyvinyl alcohols and polystyrenes, and wherein said photoionizable

group is selected from the group consisting of N,N-dimethyl-p-phenylenediamine, tetrathiafulvalene, tetraselenafulvalenes, ferrocene, tetrathiatetracene and leuco dyes.



4,297,435
CONTRAST COLORANT FOR PHOTOPOLYMERIZABLE COMPOSITIONS

Jennings L. Jolly, Santa Clara, and Leo Roos, San Jose, both of Calif., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 15,980, Feb. 26, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,310

Int. Cl.³ G03C *1/52, 1/68*

U.S. Cl. 430—270 **11 Claims**

1. A contrast colorant for photopolymerizable compositions comprising in combination a leuco triarylmethane dye in combination with a sufficient amount for formation of the colored form of said dye upon irradiation with actinic light of a bromine-substituted cyclohexane wherein said substituents comprise at least five bromine atoms and from 0 to 1 chlorine atoms.

5. A photopolymerizable composition comprising:

(1) an addition polymerizable photoinitiator;

(2) a polymeric binder;

(3) a polymerizable monomer capable of photopolymerization initiated by said photoinitiator; and

(4) a contrast colorant composition comprising in combination a leuco triarylmethane dye in combination with a sufficient amount for formation of the colored form of said dye upon irradiation with actinic light of a bromine-substituted cyclohexane, wherein said substituents are other than geminally substituted and comprise at least five bromine atoms and from 0 to 1 chlorine atoms.

4,297,436
METHOD FOR PRODUCING A MULTILAYER PRINTING PLATE

Kikuo Kubotera; Masamichi Sato; Akira Kashiwabara, and Kotaro Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

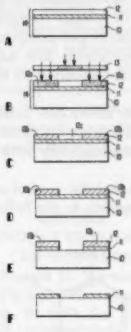
Continuation of Ser. No. 645,049, Dec. 29, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 914,704

Claims priority, application Japan, Dec. 26, 1974, 49/443

Int. Cl.³ G03F *7/02;* **G03C** *5/00*

U.S. Cl. 430—310 **55 Claims**

1. A method for producing a multi-layer printing plate consisting essentially of image-wise exposing and tanning developing a light-sensitive printing plate material which comprises a support with an oleophilic surface having thereon a hydrophilic metal layer having thereon at least one silver halide emulsion layer comprising a silver halide and a water-soluble binder, either directly or on at least one subbing layer on the hydrophilic metal layer to thereby form hardened silver image areas and unhardened non-silver image areas; removing the unhardened areas by washing with water; baking the hardened silver image areas to render them a water impermeable resist image, removing said hydrophilic metal layer at the non-resist image areas by etching and then removing the resist image.



4,297,437
PROCESSING METHOD OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yutaka Kaneko; Shigeto Hirabayashi; Satoshi Kawakatsu, and Hidetaka Ninomiya, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,582

Claims priority, application Japan, Nov. 22, 1979, 54-151511

Int. Cl.³ G03C *7/00*

U.S. Cl. 430—376 **4 Claims**

1. A method for processing an exposed color photographic material which comprises on a support

(1) at least one of hydrophilic coloidal layer one of which layer containing a silver halide emulsion and a coupler, and

(2) a color developing agent or a precursor thereof in the hydrophilic layer, wherein the exposed color photographic material is developed in a color developer containing a color developing agent which color developer is replenished with a replenisher containing 0 to 0.016 mol/l of a color developing agent.

4,297,438
COLOR-PHOTOGRAPHIC DEVELOPMENT PROCESS

Helmut Hüseler, Leverkusen; Heinz Meckl, Bergisch-Gladbach; Karl Lohmer, Leverkusen, and Willibald Pelz, Cologne, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 27, 1979, Ser. No. 61,472

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833655

Int. Cl.³ G03C *7/00*

U.S. Cl. 430—377 **2 Claims**

1. In the process for the chromogenic development of an exposed color photographic material having at least three silver halide emulsion layers of differing spectral sensitivities and non-diffusible color couplers associated therewith, including a diphasic system comprised of a hydrophilic binder and hydrophobic oil former and at least one of said color couplers being hydrophobic and incorporated in the hydrophilic binder by means of the hydrophobic oil former, wherein the improvement comprises

at least one cyan coupler is hydrophobic and has been incorporated in the hydrophilic binder by means of the hydrophobic oil former and

at least one yellow coupler is hydrophilic and has been incorporated in the hydrophilic binder without the aid of an oil former or is hydrophobic and has been incorporated in the hydrophilic binder by means of a second oil former

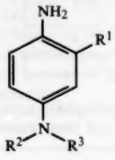
having increased hydrophilic character as compared to the hydrophobic oil former

and the chromogenic development of the exposed material is carried out with a developer composition comprising

a first hydrophobic developer compound which in its oxidized form is penetratable into said oil former in an amount to react preferentially with the hydrophobic cyan coupler, and

a second hydrophilic developer compound which in its oxidized form is present mainly in the aqueous phase in an amount to react predominantly with the hydrophilic yellow coupler

and in which the first and the second color developer compound, each corresponds to the following formula:



wherein

R^1 represents hydrogen or methyl,

R^2 represents alkyl and

R^3 represents sulfoalkyl in the second developer compound when

R^3 represents alkoxy alkyl in the first developer compound,

R^3 represents hydroxy alkyl in second developer compound when

R^3 represents methylsulfonylaminoalkyl in said first compond,

or

the second hydrophilic developer compound is selected from N-butyl-N- -sulfobutyl-p-phenylenediamine and 2-amino-5-(N-isopropyl-N- -sulfobutylamino)-toluene

and

the first developer compound is 2-amino-5-(N-ethyl-N-methylsulfonamido-ethylamino)-toluene.

4,297,439

PRODUCTION OF PHOTOGRAPHIC SILVER HALIDE EMULSION

Peter Bergthaller, Cologne; Wilhelm Saleck, Bergisch-Gladbach; Otto Lapp, Leverkusen, and Bruno Mücke, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

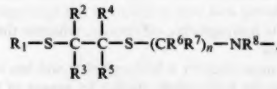
Filed May 29, 1979, Ser. No. 42,974

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824249

Int. Cl.³ G03C *1/02, 1/28*

U.S. Cl. 430—434 **8 Claims**

1. A process for the production of photographic materials containing at least one silver halide emulsion layer, characterised in that the silver halide emulsion is produced in the presence of at least one thioether corresponding to the following formula:



in which

R^1 represents an aliphatic or a cycloaliphatic or an aryl or an aralkyl radical;

R^2, R^3, R^4, R^5, R^6 and R^7 are the same of different and represent hydrogen or alkyl;

R^8 represents hydrogen;

Ac represents an acyl radical;

n=an integer with a value of at least 1.

4,297,440

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Kozo Aoki; Satoru Sawada; Yoshiharu Yabuki, and Nobuo Furutachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

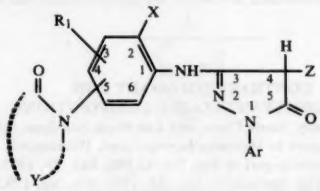
Filed Nov. 25, 1980, Ser. No. 210,184

Claims priority, application Japan, Nov. 26, 1979, 54-153359

Int. Cl.³ G03C *1/76, 1/40*

U.S. Cl. 430—505 **12 Claims**

1. A color photographic light-sensitive element comprising a support having thereon a silver halide emulsion layer containing therein a 3-anilino-5-pyrazolone magenta color forming coupler represented by formula (I)



(I)

wherein the

is present at the 4- or 5-position of the anilino group; X represents a halogen atom or an alkoxy group; Ar represents an aryl group; R_1 represents hydrogen, a halogen atom, an alkyl group, an alkoxy group, or an alkylthio group; Y represents a non-metallic atomic group forming a 5-membered or 6-membered ring together with the

group, except that Y does not include a carbonyl group; and Z represents hydrogen or a coupling-off group.

12. A color photographic light-sensitive element as in claim 1, wherein said silver halide emulsion layer containing said magenta color-forming coupler represented by formula (I) is a green-sensitive silver halide emulsion layer, and said color photographic light-sensitive element additionally includes a red-sensitive silver halide emulsion layer containing a phenolic or naphtholic cyan color-forming coupler, and a blue-sensitive silver halide emulsion layer containing a benzoylacetanilide or pivaloylacetanilide yellow color-forming coupler.

4,297,441

PHOTOGRAPHIC MATERIAL

Yutaka Kaneko; Satoshi Kawakatsu; Shigeto Hirabayashi, and Hidetaka Ninomiya, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,347

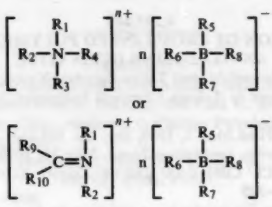
Claims priority, application Japan, Jun. 28, 1979, 54/82175

Int. Cl.³ G03C *1/06*

U.S. Cl. 430—543 **8 Claims**

1. A photographic material having a silver halide emulsion layer coated on a support, which material contains an ion compound which is composed from a compound having a quaternary nitrogen atom as a cation and a boron compound as

an anion wherein the ion pair compound is represented by the following formula:



or

wherein R_1, R_2, R_3, R_4, R_9 and R_{10} individually represent a hydrogen atom or hydroxyl, alkyl, alkenyl, cycloalkyl, aryl, phenyl, acyl, amino, carbamoyl, sulfonyl or heterocyclic groups, R_1 and R_2, or R_1, R_2, and R_3 may form a hetero nitrogen-containing ring by bonding to each other, R_5, R_6, R_7 and R_8 individually represent an alkyl, alkenyl, cycloalkyl, aryl, phenyl, heterocyclic or cyano group, an n is an integer from 1 to 5.

4,297,442

CELLULAR ELASTOMERIC FOAMS AND METHOD OF PRODUCTION USING AN EXPANDING AGENT CONTAINING A COMPONENT REACTIVE WITH THE POLYAMINE CHAIN-LENGTHENING AGENT

Johannes Blahak, Gauting-Buchendorf, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 27, 1980, Ser. No. 163,732

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928357

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—107 **12 Claims**

1. Cellular elastomeric foams produced by foaming a polyurethane or a polyurethane prepolymer and cross-linked with a polyamine-chain lengthening agent in the presence of an organic expanding agent containing at least in part a gas-forming component, which reacts with the polyamine chain-lengthening agent or with the products of reaction thereof with polyisocyanates.

4,297,443

METHOD FOR POLYURETHANE FOAM USING A TRI-TERTIARY AMINE CATALYST

Paul E. Eckler; William A. Summers, both of Terre Haute, Ind., and Ollie W. Chandler, Kildeer, Ill., assignors to International Minerals & Chemical Corporation, Terre Haute, Ind.

Continuation-in-part of Ser. No. 79,845, Sep. 8, 1979, abandoned. This application Aug. 28, 1980, Ser. No. 182,243

Int. Cl.³ C08G *18/14, 18/18;* **C07C** *87/18, 87/20*

U.S. Cl. 521—129 **4 Claims**

1. In the method of preparing a polyurethane foam by reacting a polyisocyanate with polyol in the presence of a blowing agent and a catalyst to promote the reaction, the improvement consisting of conducting the reaction in the presence of 2-heptamethyl-N,N,N′, N′,N″,N″-1,2,3-propanetriamine.

4,297,444

PROCESS FOR RIM ELASTOMERS WITH SUPERIOR HIGH TEMPERATURE DIMENSIONAL STABILITY

Richard J. G. Dominguez, and Doris M. Rice, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,238

Int. Cl.³ C08G *18/14, 18/76, 18/10, 18/82*

U.S. Cl. 521—160 **17 Claims**

1. In a method for making a polyurethane elastomer wherein an aromatic polyisocyanate, a polyether polyol based on trihydric initiators of about 4000 molecular weight and above and a chain extending agent comprising a low molecular weight active hydrogen containing compound of at least 2 functionality is injected via a RIM machine into a mold cavity of the desired configuration the improvement which comprises

mixing at least 30% of said polyether polyol with the entire amount of polyisocyanate and allowing them to react, adding the remaining polyether polyol and low molecular weight active hydrogen containing compound to the polyol and polyisocyanate reacted mixture and injecting this entire mixture into the mold cavity where it is allowed to react.

4,297,445

CONTINUOUS PRODUCTION OF OLEFIN BLOCK COPOLYMERS

James N. Short, and Donald D. Norwood, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Sep. 28, 1979, Ser. No. 79,745

Int. Cl.³ C08F *255/02, 255/04*

U.S. Cl. 525—52 **6 Claims**

1. A method for the continuous production of block copolymer comprising:

(a) producing in a first zone a first reaction mixture comprising an ethylene homopolymer by reacting ethylene monomer in the presence of a catalyst system comprising $TiCl_4$, $MgCl_2$, and an organo metallic compound at a temperature in the range of about 90° to about 200° F. and a pressure above about 500 psig sufficient to maintain non-boiling liquid conditions in said first zone for a time in the range of about 5 to about 20 minutes;

(b) continuously introducing a portion of said first reaction mixture, propylene monomer, and a catalyst modifier to a second zone; and

(c) producing in said second zone block copolymer comprising blocks of propylene homopolymer and random ethylene-propylene copolymer by reaction in the presence of a catalyst system comprising $TiCl_4$, $MgCl_2$, and an organo metallic compound at a temperature in the range of about 100° to about 180° F. and a pressure above about 500 psig sufficient to maintain non-boiling liquid conditions in said second zone for a time in the range of about 30 to about 110 minutes to provide a total copolymer composition of about 10 to about 30 percent by weight of polymers of ethylene and about 70 to about 90 percent by weight of propylene homopolymer.

4,297,446

ABS-MOULDING COMPOSITIONS HAVING HIGH NOTCHED IMPACT STRENGTH

Christian Lindner, Cologne; Karl-Heinz Ott, Leverkusen; Bernhard Arnold, Pulheim; Friedrich Kowitz, Dormagen; Harald Oertel, Odenthal, and Dieter Kuhlmann, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,597

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2837597

Int. Cl.³ C08L *51/04, 51/00*

U.S. Cl. 525—66 **2 Claims**

1. A molding composition comprising

(a) 5 to 70% by weight of at least one graft product made by graft polymerizing styrene, a mixture of styrene and acrylonitrile, a mixture of styrene and methylmethacrylate, or a mixture of styrene, acrylonitrile and methylmethacrylate onto a polybutadiene, a butadiene/styrene, or a butadiene/acrylonitrile rubber,

(b) 95 to 30% by weight of a thermoplastic resin selected from the group consisting of polystyrene, polymerized styrene and methylmethacrylate and polymerized styrene, acrylonitrile and methylmethacrylate, and 0.05–2% by weight based on the total mixture of a silico urethane

derivative which is the reaction product of an organofunctional silicone with a polyisocyanate.

4,297,447

COMPOUND FOR COATING CONTAINING FLUOROCARBONPOLYMER AND METHOD FOR ITS MANUFACTURE

Toshio Yasuda, Naka, Japan, assignor to Elastoflon Inc., Woodmere, N.Y.

Continuation of Ser. No. 930,580, Aug. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 684,639, May 12, 1976, abandoned. This application May 28, 1980, Ser. No. 153,967

Int. Cl.[3] **C08L** *63/00, 75/04, 61/04, 27/18*

U.S. Cl. 525—133 **24 Claims**

1. An improved flexible coating for a flexible heat-degradable substrate having the following essential components present together simultaneously in a percent by weight ratio based on the total weight of said coating, said essential components are (A) fluorocarbon present in said coating in an amount between 20 percent and 80 percent by weight, and (B) a thermosetting resin present in said coating in an amount between 4 percent and 14 percent by weight, said thermosetting resin selected from the group consisting of an epoxy resin, an alkylphenol resin, and a polyurethane resin which is entirely thermosetting, and (C) a rubbery elastomer present in said coating in an amount between 76 percent and 6 percent by weight, said rubbery elastomer selected from the group consisting of a nitrile rubber, a chloroprene rubber, and a rubbery polyurethane elastomer which is entirely thermoplastic, all three essential components defined as said fluorocarbon, said thermosetting resin, and said rubbery elastomer being present simultaneously together for flexibility of said coating on said heat-degradable substrate.

4,297,448

COATING COMPOSITION OF AMINOPLAST, HYDROXY POLYMERS AND VINYLIC MONOMERS

Yun-Feng Chang, Plymouth; Henk V. Oene, Detroit, and Elaine C. Beckwith, Riverview, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1979, Ser. No. 85,570

Int. Cl.[3] **C08L** *71/02, 29/00, 33/20, 51/06*

U.S. Cl. 525—162 **15 Claims**

1. A thermosetting coating composition comprising organic solvent, binder composition, and aminoplast crosslinking agent, wherein said binder composition comprises:

(A) between about 30 and about 75 weight percent of one or more low viscosity resins, each of which (1) is substantially soluble in the solvent of the composition, (2) has a number average molecular weight of between about 500 and about 3500 and (3) is selected from the group consisting of hydroxy functional acrylic polymers, hydroxy functional polyethers and hydroxy functional polyesters and bears no additional functionality which would interfere with the crosslinking reaction between the hydroxy functionality of the resin and the crosslinking agent of the composition; and

(B) between about 70 and about 25 weight percent of one or more crosslinked dispersion polymers, each of which is substantially insoluble in the solvent of the composition, said dispersion polymers being formed by free radical polymerization of 0.5 to 3.5 weight percent of di-, tri-, or tetravinyl monomers and 99.5 to 96.5 weight percent of at least one other copolymerizable monoethylenically unsaturated monomer, in the presence of a (i) hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resulting crosslinked polymer, and (ii) polymeric dispersion stabilizer which is solvated by said dispersing liquid and associated with said crosslinked polymer so as to maintain a separation between particles thereof, thereby inhibiting coagulation of said particles, wherein polymerization is carried out at elevated temperature such that the dispersion polymer first forms and then is crosslinked.

4,297,449

PRODUCTION OF CROSSLINKED POLYMERS USING AN OXAZOLINE DERIVATIVE

Jugo Goto, Kawanishi, and Takeo Saegusa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

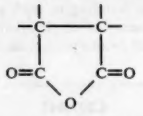
Filed May 7, 1980, Ser. No. 147,543

Claims priority, application Japan, May 15, 1979, 54-60067

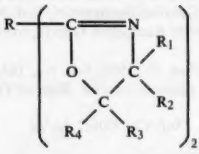
Int. Cl.[3] **C08F** *8/00, 222/04, 222/06, 222/08*

U.S. Cl. 525—329 **11 Claims**

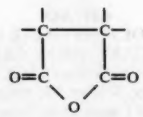
1. A process for producing a polymer having a crosslinked structure, which comprises reacting a polymer having in its molecule a partial structure of the formula:



with an oxazoline derivative of the formula:



wherein R is a di-valent aromatic hydrocarbon radical, and R_1, R_2, R_3 and R_4, which may be the same or different, are hydrogen or alkyl having not more than 3 carbon atoms, the ratio of the number of the oxazoline rings in the oxazoline derivative relative to each one of the partial structures of the formula:



in the polymer being within the range of about 1.5 to 3.0.

4,297,450

HOT MELT TYPE TRAFFIC PAINT COMPOSITIONS

Hisatake Sato; Masaharu Makino, and Hideo Hayashi, all of Yokohama, Japan, assignors to Nippon Oil Co. Ltd., Japan

Filed Jun. 2, 1980, Ser. No. 155,209

Claims priority, application Japan, Jun. 8, 1979, 54-72060

Int. Cl.[3] **C08F** *8/04*

U.S. Cl. 525—333 **13 Claims**

1. A hot melt type traffic paint composition characterized by containing as a binder a partially ring-hydrogenated resin obtained by hydrogenating from 20 to 70% of the aromatic rings of an aromatic hydrocarbon resin having a softening point between 60° and 120° C. and a bromine value of not greater than 15 obtained by polymerization in the presence of a Friedel-Crafts catalyst of a fraction prepared so as to have a conjugated diolefin content of not more than 1.0 wt % and in a ratio of not more than 3.0% with respect to the total amount of polymerizable ingredients and a total content of indene and its alkyl derivatives of not more than 4.0 wt % and in a ratio of

not more than 12.0% with respect to the total amount of polymerizable ingredients, said fraction being obtained by distillation of cracked oil fractions which have boiling points in the range of 140° to 220° C. and which are prepared by cracking of petroleum.

4,297,451

DIENYLLITHIUM INITIATED POLYMERS

Carl A. Uraneck; John E. Burleigh, and Paul W. Solomon, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 10, 1979, Ser. No. 55,868
Int. Cl.[3] C08L 49/00
U.S. Cl. 525—366 57 Claims

1. A process which comprises the steps of

(A) polymerizing to substantially complete conversion at least one first polymerizable olefinically unsaturated monomer under anionic solution polymerization conditions employing a dienyllithium initiator, thereby resulting in a polymerization admixture containing polymer terminated at least in part with a conjugated dienyl functional group, wherein said dienyllithium initiator is a product prepared by contacting at least one hydrocarbon lithium compound $R(Li)_x$ with at least one hydrocarbon 1,4-diolefin in a mixed solvent of saturated hydrocarbon/polar compound, under dienyllithium initiator forming temperature conditions, wherein R is a hydrocarbyl radical of valence x, and x is an integer of 1 to 4;

(B) treating said polymerization admixture containing polymer terminated at least in part with a conjugated dienyl functional group by a treating mode to produce a polymer selected from the group consisting of:

(a) a polymer produced by treating with an effective amount of at least one polyfunctional coupling agent of at least difunctionality, thereby preparing at least in part a coupled conjugated dienyl terminated polymer if increased molecular weight characterized by conjugated dienyl groups on the extending terminal ends of the coupled polymer;

(b) a polymer produced by treating with at least one unsaturated compound selected from the group consisting of alicyclic conjugated trienes and tetraenes, and linear conjugated dienes, thereby providing a polymer containing at least in part terminal conjugated unsaturation at both ends of the polymer chain;

(c) a polymer produced by treating with an active hydrogen-containing compound sufficient to terminate active lithium, and thereafter reinitiating polymerization with a hydrocarbon lithium initiator $R(Li)_x$, with or without the further addition of a second polymerizable monomer the same or different from said first polymerizable monomer, thereby forming a branched polymer with broadened molecular weight;

(d) a polymer produced by maintaining said conjugated dienyl terminated polymer at substantially polymerization temperatures for a time sufficient to effect at least partial self-coupling, and thereafter adding a second polymerization monomer and polymerizing thereonto, thereby resulting in a branched polymer at least in part;

(e) a polymer produced by treating as defined by substep (a) above followed by reinitiating polymerization with a further addition of a hydrocarbon lithium initiator $R(Li)_x$, with or without the further addition of a second polymerizable monomer the same or different from said first polymerizable monomer, thereby resulting at least in part in a branched polymer;

(C) wherein when any polymer resulting from any of said (a) through (e) inclusive retains active lithium, thereafter treating with an active hydrogen-containing compound effective to terminate said active lithium.

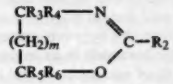
4,297,452

PROCESS FOR THE MANUFACTURE OF OXAZOLINE AND/OR OXAZINE-MODIFIED ADSORBENT POLYMER RESINS

Robert J. De Koch, Wausau, Wis.; Gerald C. Kolb, Bay City, and James W. Lalk, Shepherd, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 4, 1980, Ser. No. 109,729
Int. Cl.[3] C08F 8/20, 8/24
U.S. Cl. 525—367 8 Claims

1. In a process for graft polymerizing (i) an oxazoline or oxazine monomer corresponding to the formula



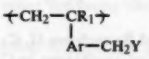
wherein:

R_2 is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms;

R_3–R_6 are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl, with the proviso that at least two of R_3–R_6 are hydrogen;

m is 0 or 1;

with (ii) a cross-linked, vinyl-addition polymer the backbone of which contains a plurality of units corresponding to the formula



wherein:

R_1 is hydrogen or methyl,

Ar is a carbocyclic aromatic nucleus, and

Y is chloro or bromo;

in an inert liquid reaction medium which dissolves the oxazoline or oxazine reactant, the improvement comprising the sequential steps of:

(A) contacting at reactive conditions the vinyl-addition polymer with a source of iodide ions, so as to introduce sufficient iodo moieties into the polymer to catalyze reaction of the polymer with the oxazoline or oxazine moiety; and

(B) contacting at reactive conditions the iodized cross-linked, vinyl-addition polymer of step (A) with from about 8 to about 24 equivalents of the oxazoline or oxazine monomer for each equivalent of halomethyl moieties borne by the polymer, so as to react up to about 50 percent of the total oxazoline or oxazine monomer present.

4,297,453

COMPOSITIONS OF EPICHLOROHYDRIN RUBBER AND NYLON

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mich.

Filed May 12, 1980, Ser. No. 149,075
Int. Cl.[3] C08L 71/02, 77/00
U.S. Cl. 525—408 22 Claims

1. A composition comprising a blend of about 20–55 parts by weight of nylon, and, correspondingly, about 80–45 parts by weight of cured epichlorohydrin rubber.

4,297,454

MANUFACTURE OF A BLOCK COPOLYMER CONTAINING A POLYETHERAMIDE AND A POLYLACTAM

Robert M. Thompson, Wilmington, Del., assignor to Suntech, Inc., Philadelphia, Pa.

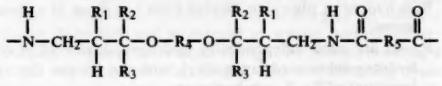
Filed Nov. 14, 1979, Ser. No. 133,370

Int. Cl.³ C08L 77/02

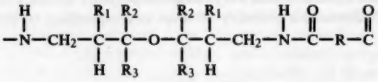
U.S. Cl. 525—432 **9 Claims**

1. Method for preparing a block copolymide comprising polymerizing a lactam in contact with a polyetheramide to form polylactam in situ to form block copolyamide by reaction of said polylactam and said polyetheramide,

wherein at least one of the lactam and polyetheramide are molten during said lactam polymerization and block copolymer formation, the lactam is present in the mixture of lactam and polyetheramide in an amount of about 5 wt.% to about 70 wt.% of said mixture, and the polyetheramide is selected from polymers of the structures:



AND



wherein R_1, R_2 and R_3 each are H, C_1–C_{10} alkyl or C_3–C_{10} isoalkyl, R_4 is C_1–C_{10} alkylene or C_3–C_{10} isolkylene, and R_5 is C_0–C_{10} alkylene, C_3–C_{10} isoalkylene or C_6–C_{20} arylene.

4,297,455

PROCESS FOR THE PREPARATION OF CARBONIC ACID ARYL ESTERS OF POLYESTER-DIOLS LENGTHENED VIA CARBONATE GROUPS AND THEIR USE FOR THE PREPARATION OF POLYESTER-DIOL BIS-DIPHENOL CARBONATES AND POLYESTER/POLYCARBONATES

Christian Lindner, Cologne; Carlhans Süling; Herbert Bartl, both of Odenthal; Manfred Schreckenberg; Dieter Freitag, both of Krefeld, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 886,212, Mar. 13, 1978, Pat. No. 4,217,297. This application May 30, 1978, Ser. No. 910,986

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712435; Jun. 11, 1977, 2726417

Int. Cl.³ C08G 63/64, 63/76, 63/00

U.S. Cl. 525—439 **42 Claims**

1. A process for the preparation of a polyesterdiol bis-diphenol carbonate, lengthened via carbonate groups, comprising:

(i) heating a polyester-diol having a molecular weight $\overline{M}n$ (number-averrage) of over 250 with a carbonic acid bis-aryl ester

(a) at a temperature between about 100° C. and about 200° C.,

(b) in vacuo below about 35 mm Hg, and

(c) in the presence of a catalyst, characterized in that less than 1 mol of carbonic acid bis-aryl ester is employed per mol of OH-groups of the polyester diol, and

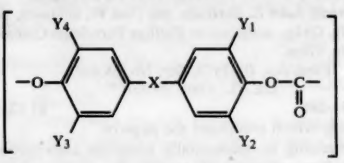
(ii) heating the resulting polyester-diol bis-carbonic acid aryl ester, lengthened via carbonate groups, with a diphenol

(a) at a temperature between about 100° C. and about 200° C.,

(b) in vacuo below about 35 mm Hg, and

(c) in the presence of a catalyst, characterized in that more than 1 mol of diphenol is employed per mol of carbonic acid aryl ester groups of the polyester-diol bis-carbonic acid aryl ester, lengthened via carbonate groups.

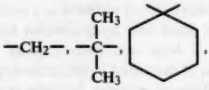
16. A polyester/polycarbonate the molecular chain of which is terminated by residues of chain stoppers comprising from about 30 to about 95% by weight of aromatic polycarbonate structural units of the formula



(III(a))

wherein

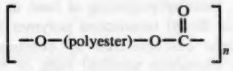
X denotes



O, S or SO_2 and

Y_1 to Y_4 are identical or different and denote hydrogen or halogen

and from about 70 to about 5% by weight of polyester-diolate block units, lengthened via carbonate groups, of the simplified formula



(VI)

wherein

-(polyester)-represents the bivalent radical of a polyester-diol, and n denotes an integer from 2 to 20.

4,297,456

PROCESS FOR WORKING UP ISOCYANATE DISTILLATION RESIDUES

Artur Reischl, and Kuno Wagner, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 88,800, Oct. 29, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,589

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846815

Int. Cl.³ C08G 18/70

U.S. Cl. 525—452 **13 Claims**

1. A process for working up tolylene diisocyanate distillation residues into useable starting products for the production of plastics, wherein such distillation residue is a substantially monomer-free, crosslinked distillation residue which is insoluble in inert organic solvents and which cannot be melted without decomposing, of the type accumulating as slag in the removal of monomeric tolylene diisocyanates by distillation from the crude phosgenation product of tolylene diamines, comprising grinding said distillation residues to a mean particle size of less than 800 mμ.

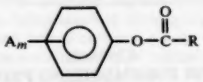
4,297,457

CURABLE EPOXY RESIN COMPOSITION

Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 11, 1980, Ser. No. 168,635
Int. Cl.[3] C08G 59/68
U.S. Cl. 525—507 33 Claims

1. A composition of matter comprising an epoxy resin, a cure initiator, and an accelerator of the general formula



where R is independently selected from the class consisting of hydrogen, monovalent alkyl, aryl, alkaryl, aralkyl, vinyl and allyl radicals; A is independently selected from the class consisting of hydrogen, monovalent alkyl, alkoxy, halogen, cyano and amino radicals, and m is a whole number from 1 to 2, inclusive.

2. A composition of matter as in claim 1, wherein the cure initiator is a titanium or zirconium ester.

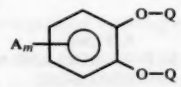
4,297,458

CURABLE EPOXY RESINS

Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,037
Int. Cl.[3] C08G 59/68
U.S. Cl. 525—507 33 Claims

1. A composition of matter comprising an epoxy resin, a cure initiator, and an accelerator of the general formula



where Q is independently selected from the class consisting of Si—R_3 or hydrogen and, R is independently selected from the class consisting of hydrogen, monovalent alkyl (including aralkyl) groups of from 1 to 8 carbon atoms; aryl, alkaryl, vinyl, and allyl radicals, A is independently selected from alkyl radicals the same as R above, halogen and the nitro radical, where A can be ortho-, meta-, or para- to either of the —OQ radicals, and m is an integer from 1 to 2, inclusive, with the proviso, that only one Q can be hydrogen, and only one R can be hydrogen on one silicon atom.

2. A composition of matter as in claim 1, wherein the cure initiator is a titanium or zirconium ester.

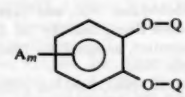
4,297,459

CURABLE EPOXY RESINS

Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1980, Ser. No. 176,467
Int. Cl.[3] C08G 59/68
U.S. Cl. 525—507 25 Claims

1. A composition of matter comprising an epoxy resin, a cure initiator, and an accelerator of the general formula



where Q is independently selected from the class consisting of allyl radicals having from 3 to 15 carbon atoms, or hydrogen radicals and A is independently selected from the class consisting of monovalent alkyl (including aralkyl) groups of from 1 to 8 carbon atoms, halogen and the nitro radical, where A can be ortho-, meta-, or para- to either of the —OQ radicals, and m is an integer from 0 to 2, inclusive, with the proviso that only one Q can be hydrogen.

2. A composition of matter as in claim 1, wherein the cure initiator is a titanium or zirconium ester.

4,297,460

TREATMENT OF SILICA

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Division of Ser. No. 44,809, Jun. 1, 1979, Pat. No. 4,248,735, which is a continuation-in-part of Ser. No. 857,552, Dec. 5, 1977, abandoned. This application Jul. 30, 1980, Ser. No. 173,525
Int. Cl.[3] C08F 4/02, 4/24, 4/78
U.S. Cl. 526—98 23 Claims

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-containing support at an elevated temperature to a treating ambient selected from (1) carbon monoxide, (2) a halogen-containing component selected from bromine, iodine, HBr, HI, organic bromides, and organic iodides, which halogen-containing component also either contains air or is followed by air or (3) a carbon, oxygen and sulfur-containing composition, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

22. A method according to claim 1 wherein said support is preoxidized by being subjected to oxidation conditions after being subjected to said ambient and prior to incorporation of said chromium compound.

4,297,461

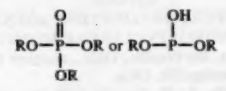
OLEFIN POLYMERIZATION CATALYST

Anthony N. Speca, Cincinnati, Ohio, assignor to National Petro Chemicals Corp., New York, N.Y.

Division of Ser. No. 46,985, Jun. 8, 1979, Pat. No. 4,238,353, which is a continuation-in-part of Ser. No. 924,470, Jul. 14, 1978, abandoned. This application Apr. 17, 1980, Ser. No. 141,095
Int. Cl.[3] C08F 4/78
U.S. Cl. 526—100 7 Claims

1. A process for polymerizing an olefin which comprises contacting the olefin with a catalyst system produced by a process which comprises:

(a) depositing an organophosphoryl chromium reaction product of chromium trioxide and phosphorus compound having the formula



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen but at least one R is other than hydrogen, upon a solid inorganic support material;

(b) depositing the non-volatile aluminum-containing product obtained from the reaction of an aluminum alkoxide and an aluminum carboxylic acid salt upon said support material; and,

(c) heat-activating said supported organophosphoryl chromium reaction product and non-volatile aluminum-containing reaction product in a non-reducing atmosphere at a temperature above about 300° C. up to the decomposition temperature of the support material.

4,297,462

POLYMERIZATION OF MONOOLEFINS USING AN ALUMINUM-TITANIUM CATALYST SYSTEM

Margherita Corbellini, Milan; Alberto Greco, Dresano, and Mirko Oselame, Ombriano, all of Italy, assignors to Snamprogetti S.p.A, Milan and Anic S.p.A, Palermo, both of, Italy

Division of Ser. No. 915,998, Jun. 16, 1978, Pat. No. 4,203,866.
This application Sep. 25, 1979, Ser. No. 78,899
Claims priority, application Italy, Jun. 30, 1977, 25232 A/77
Int. Cl.[3] C08F *4/64*
U.S. Cl. 526—125 14 Claims

1. A method for the polymerization or copolymerization of monoolefins which comprises contacting said monolefin with a catalyst system composed of an aluminum derivative of the formula AlR_pX_{3-p} in which R is a hydrocarbonaceous radical, X is a halogen radical and p is a number from 1 to 3; in combination with a composition based on a titanium halide in which said titanium has a valence of three or greater and a halide of a metal, said metal selected from zirconium, molybdenum, zinc or calcium, said composition prepared by reacting a titanium compound with the vapors of one or more of said metals in the presence of a halogen donor, and wherein the metal:titanium molar ratio is greater than 1:n, n being the valency of the metal with the greatest valency.

4,297,463

METHOD FOR POLYMERIZING α-OLEFIN

Haruo Ueno, Chiba; Takefumi Yano, Ichihara; Tokuji Inoue, Ichihara; Shigeru Ikai, Ichihara; Yoshiyuki Kai, Ichihara, and Michimasa Shimizu, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Chiba, Japan

Filed May 6, 1980, Ser. No. 147,279
Claims priority, application Japan, Sep. 21, 1979, 54-120726
Int. Cl.[3] C08F *4/02, 10/06*
U.S. Cl. 526—128 25 Claims

1. A method for polymerizing an α-olefin which comprises bringing, in the presence of an organic acid ester, a feed containing at least one α-olefin having 3 or more carbon atoms into contact with a catalyst comprising (A) a solid catalytic ingredient prepared by (a) reacting an aluminium halide with a tetraalkoxysilane to form a first reaction product, (b) reacting a Grignard compound with said first reaction product to form a second solid reaction product, (c) contacting said second solid reaction product with a titanium tetrahalide, (d) treating the resultant titanium-containing solid product with an organic acid ester and, finally, (e) contacting the treated solid product with a titanium tetrahalide; and (B) another catalytic ingredient consisting of at least one trialkyl aluminium.

4,297,464

ORTHOESTERS AS COUPLING AGENTS FOR PRODUCING MONOVINYLARENE HOMOPOLYMERS

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

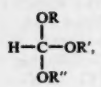
Division of Ser. No. 5,625, Jan. 22, 1979, Pat. No. 4,238,576.
This application Aug. 15, 1980, Ser. No. 178,402
Int. Cl.[3] C08F *4/46, 8/06, 8/14*
U.S. Cl. 526—181 4 Claims

1. A method of producing coupled monovinylarene homopolymers, said method comprising:

(a) forming a polymerization mixture comprising (1) at least one monomer selected from the group consisting of monovinylarenes and (2) an organo alkali metal initiator;

(b) polymerizing said at least one monomer so as to form living homopolymer molecules;

(c) coupling said living homopolymer molecules with an orthoester, said orthoester having the formula



wherein R, R′, and R″ are the same or different and are individually selected from alkyl groups.

4,297,465

CATALYSTS FOR POLYMERIZING PROPYLENE IN A HIGH TEMPERATURE SOLUTION PROCESS

Thomas W. Smith, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,955
Int. Cl.[3] C08F *2/06, 10/06*
U.S. Cl. 526—141 15 Claims

1. The process for polymerizing an α-mono-olefin containing at least 3 carbon atoms to solid, high molecular weight polymer having a crystallinity of at least 72% which comprises contacting said α-mono-olefins, at a temperature in the range of about 120° to about 300° C. and a pressure in the range of about atmospheric to about 2,000 atmospheres, with a catalyst mixture comprising (1) an aluminum trialkyl, (2) a halide of a transition metal selected from the group consisting of titanium and vanadium, the valence of the metal in said halide being at least one less than maximum and (3) a 2-amino alkyl carboxylate wherein the molar ratio of catalyst components is 0.5–10/1/0.05–1.

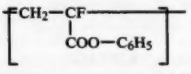
4,297,466

NOVEL ACRYLIC POLYMERS AND METHOD OF MAKING SAME

Bertrand Bloch, Paris; Chantal Cavalli born Meyer, Voisins le Bretonneux, and Denis Charrier, Antony, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon sous Bagneux, France

Filed Dec. 11, 1979, Ser. No. 102,427
Claims priority, application France, Dec. 15, 1978, 78 35459
Int. Cl.[3] C08F *6/00, 14/18*
U.S. Cl. 526—218 15 Claims

1. An acrylic polymer comprising recurring units of the formula:



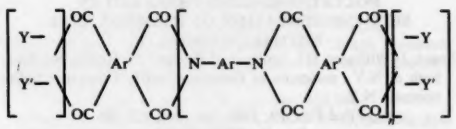
4,297,467

POLYMERIZATION PRODUCTS OF POLYIMIDE DERIVATIVES HAVING UNSATURATED TERMINAL AMIDE GROUPS

Phillip A. Waitkus, Sheboygan, Wis., and Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), assignors to Plastics Engineering Company, Sheboygan, Wis.

Filed Jan. 25, 1980, Ser. No. 115,483
Int. Cl.[3] C08F *26/06*
U.S. Cl. 526—259 21 Claims

1. A cured polymerization product of the unsaturated amide of the formula:



wherein:

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical except that in the case of the Ar' being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

Ar is a divalent aromatic organic radical;

n is zero or an integer of at least one;

Y is —NRR';

R is an organic moiety containing 1 to 18 carbon atoms;

R' is an organic moiety containing 2 to 14 carbon atoms and having a terminal CH_2=CH— structure;

Y' is —NRR, —OR, —OH or —X;

X is a halogen.

4,297,468

ALLYL AMIDO PHOSPHOROUS COPOLYMERS

Miroslav Chmelir, Krefeld, and Kurt Dahmen, Monchengladbach, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Krefeld, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,614

Claims priority, application Fed. Rep. of Germany, May 23, 1978, 2822423

Int. Cl.³ C08F *230/02*

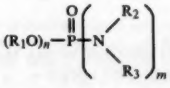
U.S. Cl. 526—276 **9 Claims**

1. A cross-linked copolymer consisting of polymerized units of

(A) at least one olefinically unsaturated carboxylic acid,

(B) at least one mono-olefinically unsaturated monomer in up to four times the weight of (A), and

(C) 0.1 to 4% by weight of (A) plus (B) of at least one allyl monomer of the formula



in which

n=0, 1 or 2,

m=1, 2 or 3,

n+m=3,

R_1=hydrogen, or an alkyl, alkoxyalkyl, haloalkyl, cycloalkyl, aryl, alkaryl, or alkenyl radical, and

R_2 and R_3 each independently is hydrogen or an allyl, alkyl, cycloalkyl, aryl, aralkyl or alkaryl radical,

at least two of the radicals R_1, R_2 and R_3 being an allyl radical or a substituted allyl radical.

4,297,469

BIPOLYMER OF VINYL SULFONIC ACID-GLYCIDOL ADDUCT AND ACRYLAMIDE

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 916,984, Jun. 19, 1978, Pat. No. 4,228,017. This application Apr. 4, 1980, Ser. No. 137,183

Int. Cl.³ C03F *228/02*

U.S. Cl. 526—287 **3 Claims**

1. A water-soluble copolymer consisting of repeating units of (a) vinyl sulfonic acid alkoxylated with 2,3-epoxy-1-propanol, and (b) acrylamide having a number average molecular weight of about 10,000 to about 2,000,000.

4,297,470

IMAGE FORMING PROCESS

Chiaki Osada; Masato Satomura, and Hisatake Ono, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

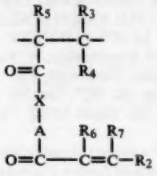
Continuation of Ser. No. 212,530, Dec. 27, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,685

Claims priority, application Japan, Dec. 26, 1970, 45/118984

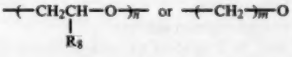
Int. Cl.³ C08F *20/26, 20/58*

U.S. Cl. 526—304 **4 Claims**

1. A process for producing photosensitive homopolymers containing the recurring unit:



wherein A is:



wherein R_8 is a hydrogen atom or an alkyl group having 1 to about 6 carbon atoms, n is the integer of 1, m is an integer or from 1 to 6;

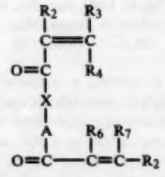
R_2 is:

R_3 and R_4 are each hydrogen:

R_5 is a hydrogen atom or an alkyl group having from 1 to about 6 carbon atoms:

R_6 is a hydrogen atom: X is —O— or —NH—

R_7 is hydrogen, which process comprises preparing a mixture containing a monomer represented by the general formula:



wherein A, X, R_2, R_3, R_4, R_5, R_6 and R_7 are as defined above, and a polymerization initiator under an inert atmosphere; and holding said mixture under an inert atmosphere for time sufficient for the polymer to form.

4,297,471

ODORLESS OR LOW-ODOR CROSSLINKABLE COMPOUND AND RESIN COMPOSITION CONTAINING THE SAME

Tohru Koyama, Hitachi; Toshikazu Narahara, Tokaimura, and Yuji Aimono, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 139,025
Claims priority, application Japan, Apr. 13, 1979, 54-45596; Apr. 17, 1979, 54-47677
Int. Cl.[3] C08G *10/04*; C07C *69/54*
U.S. Cl. 526—328 10 Claims

1. A crosslinkable compound obtained by reacting an aromatic hydrocarbon-formaldehyde resin with an α,β-unsaturated monocarboxylic acid or an ester thereof in the presence of an esterification or ester interchange catalyst.

4,297,472

METHOD OF PRODUCING COLOR STABLE THERMOPLASTIC POLYMETHANES AND PRODUCTS MADE THEREBY

Herbert L. Heiss, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1977, Ser. No. 828,121
Int. Cl.[3] C08G *18/32, 18/42*
U.S. Cl. 528—84 6 Claims

1. A method of improving the color stability of thermoplastic polyurethanes prepared from a reaction mixture comprising
(a) an aromatic polyisocyanate,
(b) a polyester polyol, and
(c) an active hydrogen containing chain extender, said method comprising
(A) adding to said reaction mixture
(d) from 0.05 to 2 percent by weight based on the total weight of said reaction mixture of a hydroxyl group containing additive, said additive characterized as
(i) having a molecular weight of 400 or less, and
(ii) containing 2 to 4 aliphatic hydroxyl groups with at least 2 of said hydroxyl groups being vicinal and with the vicinal hydroxyl groups being primary and/or secondary, said additive (d) not being present in component (b) or (c), and
(B) reacting said components (a), (b), (c) and (d).

4,297,473

QUICK-CURING PHENOLIC RESIN AND PROCESS FOR PREPARING SAME

Shigeru Koshibe, Toride, and Motoyuki Nanjo, Yokohama, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,104
Claims priority, application Japan, May 21, 1979, 54-61478
Int. Cl.[3] C08G *8/10*
U.S. Cl. 528—144 5 Claims

1. A process for producing a quick-curing phenolic resin having an ortho linkage to para linkage ratio ranging from 0.85 to 2.5 and a number-average molecular weight of the resin exclusive of free phenol of 500 to 1,200, which comprises
reacting phenol (P) with formaldehyde (F) in a F/P molar ratio ranging from 0.6 to 1.0 using only as a catalyst at least one acid selected from the group consisting of formic acid, oxalic acid, malonic acid, and succinic acid, said reaction being effected at a temperature of 105°–130° in at least the first stage for 3–5 hours.

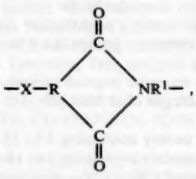
4,297,474

POLYETHERIMIDES PREPARED BY SELF-CONDENSATION OF HYDROXYARYL PHTHALIMIDE SALTS

Frank J. Williams, III, Scotia, and Howard M. Relles, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 29, 1980, Ser. No. 125,796
Int. Cl.[3] C08G *73/10*
U.S. Cl. 528—170 7 Claims

1. Polyetherimides comprising chemically combined units of the formula,



where R is a trivalent $C_{(6-13)}$ aromatic organic radical, R^1 is a divalent $C_{(6-30)}$ aromatic organic radical and X is selected from —O—, or —S—.

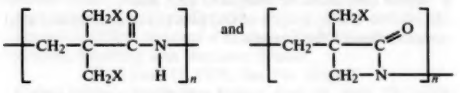
4,297,475

FLAME RETARDANT INTUMESCENT POLYAMIDE FROM HALOAMIDE

Linnea E. Nelson, and Charles E. Reineke, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 870,312, Jan. 18, 1978. This application Apr. 24, 1978, Ser. No. 899,185
Int. Cl.[3] C08G *69/00, 69/22*
U.S. Cl. 528—271 10 Claims

1. A solid polyamide composition consisting essentially of repeating structural units of the formulas



wherein
X is independently chloro or bromo, and n and n' are each independently a positive integer.

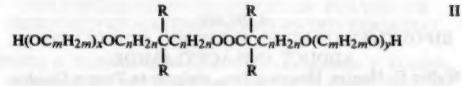
4,297,476

ESTER DIOL ALKOXYLATE BASED ALKYD RESINS

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 153,457
Int. Cl.[3] C08G *63/66*
U.S. Cl. 528—300 21 Claims

1. An alkyd resin comprising the reaction product of (A) an ester diol alkoxylate of the formula



II

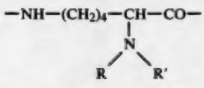
wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20, and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms with (B) a polyol and (C) a polycarboxylic acid or anhydride thereof.

4,297,477
POLYAMIDE HAVING —NH—$(CH_2)_4$—CH(NRR')—CO—UNITS

Minoru Nakata, Suzuka; Haruyo Sato, and Shinzo Imamura, both of Nagoya, all of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Filed Dec. 31, 1979, Ser. No. 108,941
Claims priority, application Japan, Jan. 5, 1979, 54-856; Jan. 5, 1979, 54-857; Jan. 5, 1979, 54-858
Int. Cl.³ C08G *69/14*
U.S. Cl. 528—323 7 Claims

1. A basic polyamide having a repeating unit represented by the formula:



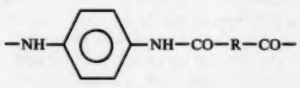
wherein R and R' each is a lower alkyl group having 1 to 4 carbon atoms, and having a relative viscosity of at least 1.5 measured at 25° C. in a solution of said basic polyamide at a concentration of 1 gr/100 ml. in a 98% sulfuric acid solvent.

4,297,478
PROCESS FOR THE DISCONTINUOUS PRODUCTION OF AROMATIC IN MIXTURE OF POLYAMIDES CALCIUM CHLORIDE AND N-METHYLPYRROLIDONE-2

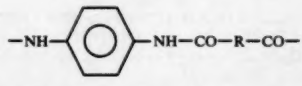
Vincent Rochina, L'Arbresle, and Jean Sacco, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 18, 1978, Ser. No. 897,499
Claims priority, application France, Apr. 27, 1977, 77 13620
Int. Cl.³ C08G *69/28*
U.S. Cl. 528—336 6 Claims

1. A process for the discontinuous production of a spinnable polyamide consisting of repeating units of the generic formula:



in which 50 to 100% of the radicals R are p-phenylene radicals and the remaining 0 to 50% of the radicals R consist essentially of n-butylene radicals, which polyamide has a fiber-forming viscosity, measured at 25° C. on a solution in 100% strength sulphuric acid which has a concentration of 0.5 g of polymer in 100 ml of solvent, characterized in that terephthaloyl chloride, or terephthaloyl chloride and adipoyl chloride, is reacted with a solution selected from the group consisting of para-phenylenediamine, 4,4'-diaminoadipanilide, and a mixture of the same, in a mixture of N-methylpyrrodlidone-2 and calcium chloride, under conditions such that: the acid chloride or chlorides and the diamine or diamines are in essentially stoichiometric proportions; the solution of diamine or diamines in the mixture of N-methylpyrrolidone-2 and $CaCl_2$ is homogeneous and substantially anhydrous; with the $CaCl_2$ initially being in and remaining in solution at the time of its use; the calcium chloride content is such that the ratio C_m of the number of mols of calcium chloride to the number of units:



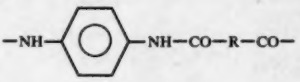
is between 0.70 and 2.90; and the relative amounts of reactants and solvents are chosen such that, at the end of the reaction, the polymer content of the resulting polymer-containing composition obtained is between 5 and 16% by weight, relative to the N-methylpyrrolidone-2.

4,297,479
PROCESS FOR THE CONTINUOUS PRODUCTION OF AROMATIC POLYAMIDES IN A MIXTURE OF CALCIUM CHLORIDE AND N-METHYLPYRROLIDONE-2

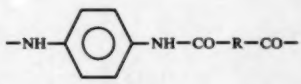
Vincent Rochina, L'Arbresle, and Jean Sacco, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 18, 1978, Ser. No. 897,500
Claims priority, application France, Apr. 27, 1977, 77 13619; Feb. 20, 1978, 78 05000
Int. Cl.³ C08G *69/28*
U.S. Cl. 528—336 8 Claims

1. A process for the continuous production of a spinnable polyamide-containing composition consisting of repeating units of the generic formula:



in which 50 to 100% of the radicals R are p-phenylene radicals and the remaining 0 to 50% of the radicals R consist essentially of n-butylene radicals, which polyamide has a fiber-forming viscosity, measured at 25° C. on a solution in 100% strength sulphuric acid which has a concentration of 0.5 g of polymer in 100 ml of solvent, characterized in that (a) molten terephthaloyl chloride, or (b) molten terephthaloyl chloride in admixture with adipoyl chloride, is reacted continuously with a solution of (c) para-phenylenediamine, or (d) 4,4'-diaminoadipanilide, or (e) a mixture of (c) and (d), or (f) a mixture of (c) and (g) a prepolymer formed from at least one chloride and at least one diamine from amongst those mentioned above, or (d) in admixture with (g), or (e) in admixture with (g), in a mixture of N-methylpyrrolidone-2 and calcium chloride, under conditions such that: the acid chloride or chlorides and the diamine or diamines are in essentially stoichiometric proportions; the solution of diamine or diamines, and when present the prepolymer, in the mixture of N-methylpyrrolidone-2 and calcium chloride, is homogeneous and substantially anhydrous; with the $CaCl_2$ being in and remaining in solution at the time of its use; the molar ratio of calcium chloride to the number of units:



is at least 1; and the relative amounts of reactants and solvents are chosen such that, at the end of the reaction, the resulting polymer-containing composition contains at least 5% by weight of polyamide, relative to the N-methylpyrrolidone-2.

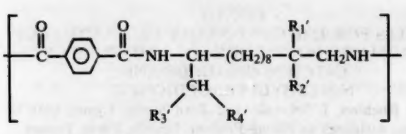
4,297,480
TRANSPARENT POLYAMIDE FROM BRANCHED CHAIN C_{11} DIAMINE

Josef Pfeifer, Therwil, Switzerland, and Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignors to Giba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,142
Claims priority, application Switzerland, Oct. 18, 1978, 10771/78
Int. Cl.³ C08G *69/26*
U.S. Cl. 528—346 5 Claims

1. A transparent polyamide having a reduced specific viscosity of at least0.5 dl/g, measured on a 0.5% solution in m-cresol

at 25° C., which polyamide consists of recurring structural elements of formula Ia



(Ia)

wherein R_1' and R_2' are each methyl or ethyl, or together are alkylene having 4–7 C atoms, R_3' is methyl or ethyl, and R_4' is alkyl having 1–4 C atoms, or R_3' and R_4' together are alkylene having 4–7 C atoms.

4,297,481

PROCESS OF FORMING POLYMERIC POLYAMINE/AMIDE

Felek Jachimowicz, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,739

Int. Cl.³ C08G *67/02*

U.S. Cl. 528—392 **8 Claims**

1. A process for forming polymeric polyamine/amide wherein said amino/amido nitrogens are positioned in the polymer backbone comprising contacting, in a reaction zone containing an inert solvent, and, as reactants, a hydrocarbon compound containing at least two olefinic groups therein, water, carbon monoxide and a nitrogen containing compound having at least 2 labile hydrogens, at a temperature of from about 50° to 250° C. and at a pressure of from about 30 to about 300 atmospheres in the presence of a catalyst consisting essentially of a rhodium atom containing compound selected from metallic rhodium, rhodium salts, rhodium carbonyls, rhodium oxides or ligands thereof.

4,297,482

CHAIN-EXTENDED POLYOL COMPOSITIONS AND METHOD

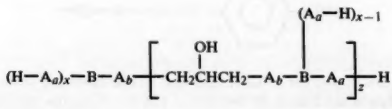
Louis L. Wood, Rockville, and Donald W. Larsen, Marriotsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 103,248, Dec. 13, 1979, which is a continuation-in-part of Ser. No. 23,912, Mar. 26, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,114

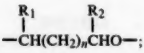
Int. Cl.³ C08G *59/00*

U.S. Cl. 528—405 **4 Claims**

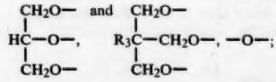
1. A polyol composition containing at least three OH groups of the general formula:



wherein A is



B is selected from the group consisting of



at least one of R_1 and R_2 is H and the other is independently selected from the group consisting of H, CH_3 and phenyl; R_3 is H, CH_3, CH_2CH_3 or $—OCH_2—$ *n is O or* 2; x is 1–3; z is 1–10 and a and b are independently selected from 1 to 1000.

4,297,483

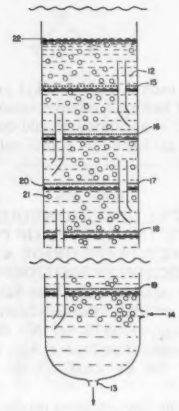
PROCESS FOR REDUCING THE VINYL CHLORIDE CONTENT OF AQUEOUS DISPERSIONS OF VINYL CHLORIDE POLYMERS

Glor T. Mejdell; Odd E. Palmgren; Arne Talmoen, and Bjarne Vik, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s, Norway

Continuation-in-part of Ser. No. 891,116, Mar. 28, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,740

Int. Cl.³ C08F *6/00, 14/06*

U.S. Cl. 528—500 **2 Claims**



1. In a process for the reduction of the vinyl chloride content of aqueous dispersions of vinyl chloride polymers and copolymers after completion of polymerization and after pressure release and preceding removal of thereby released vinyl chloride, by counter-current stripping with steam in a perforated plate column, the plates of which are equipped with downcomers, the improvement wherein the amount of steam introduced at the bottom of the column is adjusted in such relation to the hole area of an individual plate that the pressure drop across one plate gives a steam space between two adjacent perforated plates of not more than 50 mm in height such that the steam space is established just underneath the upper perforated plate and whereby the liquid layer is maintained above the lower perforated plate, and the liquid by bubbling steam therethrough, flushes the wall surfaces of the column in the steam space and said perforated plates to become clear of polymer particles, and further that the amount of dispersion fed to the top of the column and the amount of outgoing, stripped dispersion and adjusted in such relation to each other, that at any time, the liquid layer is maintained substantially above the downcomer of the uppermost perforated plate, and that above the liquid level and the level at which the dispersion is fed, a liquid is introduced which continuously or discontinuously flushes the wall of the column.

4,297,484

QUATERNIZED DERIVATIVES OF POLYMERIZED PYRIDINES AND QUINOLINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 23, 1979, Ser. No. 32,044

Int. Cl.³ C08G *73/06;* C07D *213/04, 215/04, 221/06*

U.S. Cl. 528—423 **4 Claims**

1. A quaternized derivative of polymerized pyridine or

quinoline compounds, which compounds prior to polymerization are selected from the group consisting of pyridine, 2-methyl pyridine, 4-methyl pyridine, 4-phenyl pyridine, 4-ethyl pyridine, 2-hydroxypyridine, 2,4-lutidine, quinoline, 2-methyl quinoline and 4-methyl quinoline, the nitrogen atoms of which are quaternized by treating said polymerized compounds with a quaternizing agent selected from the group consisting of methyl iodide, ethyl iodide, propyl iodide, ethyl bromide, benzyl bromide, butyl bromide, dodecyl bromide, benzyl chloride, dodecyl benzyl chloride, ethyl bromoacetate, dimethyl sulfate, tetradecyl bromide and octyl bromide at a temperature of at least about 100° C.

4,297,485

PRODUCTION OF A SELECTIVELY PROTECTED N-ACYLATED DERIVATIVE OF AN AMINOGLYCOSIDIC ANTIBIOTIC

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya; Yasushi Takagi, both of Yokohama, and Tomo Jikihara, Kawasaki, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Nov. 2, 1979, Ser. No. 90,591

Claims priority, application Japan, Nov. 11, 1978, 53-138402; Jun. 12, 1979, 54-73064

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—10 **20 Claims**

1. A process for the production of a selectively acylated N-protected derivative of an aminoglycosidic antibiotic, this aminoglycosidic antibiotic consisting essentially of a 6-0 (3″-amino- or 3″-alkylamino-3″-deoxyglycosyl)-2-deoxystreptamine having or not having a 4-0-(aminoglycosyl) group, and the selectively acylated N-protected derivative having all amino groups other than 1-amino and 3″-amino groups thereof selectively protected with an acyl group, which comprises the steps of:

(a) reacting an acylation reagent having an acyl group to be introduced as the amino-protecting group, with an aminoglycosidic antibiotic-zinc cation complex which has been formed by reaction of the aminoglycosidic antibiotic with a zinc salt in an inert organic solvent, to produce a complex of zinc cations with the selectively N-acylated derivative of the aminoglycosidic antibiotic having the initially non-complexed amino groups acylated,

(b) and reacting the complex of zinc cations with the selectively N-acylated derivative of the aminoglycosidic antibiotic, with a reagent which removes zinc cations from said complex, to produce the desired selectively acylated N-protected derivative of the aminoglycosidic antibiotic.

4,297,486

AMINOGLYCOSIDE ANTIBIOTIC G-367-1 AND METHOD FOR THE PRODUCTION THEREOF

Tadashiro Fujii, Mishima; Shuzo Satoi, Shizuoka; Naoki Muto, Shizuoka; Mitsuo Hayashi, Shizuoka; Akira Kodama, Shizuoka, and Masaru Otani, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

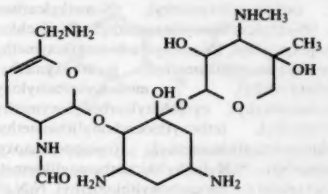
Filed Apr. 3, 1980, Ser. No. 137,292

Claims priority, application Japan, Apr. 4, 1979, 54-41274; Aug. 16, 1979, 54-104770

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—17 R **1 Claim**

1. Aminoglycoside antibiotic of the formula



and the non-toxic acid addition salts thereof.

4,297,487

PHOSPHONIUM SALTS

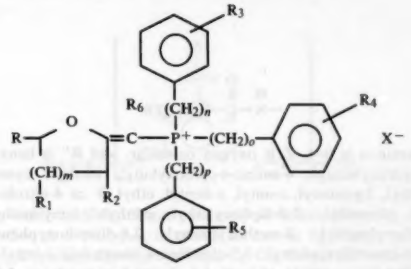
Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Aug. 6, 1980, Ser. No. 175,791

Int. Cl.³ C07F *9/54*

U.S. Cl. 542—412 **16 Claims**

1. A phosphonium salt represented by the formula:



wherein: R is selected from the group consisting of phenyl, substituted phenyl, benzyl and substituted benzyl; R_1 is hydrogen or lower alkyl; R_2 is hydrogen or loweralkyl; or R_1 and R_2 taken together form a 5 or 6 membered saturated or unsaturated carbocyclic ring with the limitation that R_1 is on the carbon atom adjacent the carbon atom bearing R_2, m is 1,2 or 3; n is 0 or 1; o is 0 or 1; p is 0 or 1; R_3, R_4 and R_5 are the same or different members of the group consisting of hydrogen, lower alkyl, lower alkoxy and halo; R_6 is hydrogen or C_1–C_3 straight or branched chain alkyl; and X is a pharmaceutically acceptable anion.

4,297,488

7-α-METHOXY CEPHALOSPORINS

Burton G. Christensen, Scotch Plains; Lovji D. Cama, Edison; Sandor Karady, Elizabeth, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 2, 1971, Ser. No. 149,364

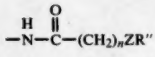
Claims priority, application United Kingdom, Jun. 16, 1970, 29158/70; Jul. 9, 1970, 33415/70; Sep. 30, 1970, 46556/70; Dec. 10, 1970, 58731/70; Jan. 27, 1971, 3296/71; Jan. 27, 1971, 3297/71; Jan. 27, 1971, 3298/71; Feb. 8, 1971, 4179/71; Feb. 11, 1971, 4479/71; Feb. 11, 1971, 4480/71; Feb. 26, 1971, 5588/71; Apr. 30, 1981, 29158/81

Int. Cl.³ C07D *501/57*; A61K *31/545*

U.S. Cl. 544—21 **11 Claims**

1. The compound 3-A-7-methoxy-7-acylamido-3-cephem-4-carboxylic acid wherein A is methyl, hydroxymethyl, chloromethyl, bromomethyl, or fluoromethyl, mercaptomethyl, methoxymethyl, n-propoxymethyl, methylthiomethyl, acetoxymethyl, propionyloxymethyl, benzoyloxymethyl, (p-chlorobenzoyl)oxymethyl, (p-methylbenzoyl)oxymethyl,

pivaloyloxymethyl, (1-adamantyl)carboxymethyl, butanoyloxymethyl, carbamoyloxymethyl, (N-methylcarbamoyl)oxymethyl, (N-ethylcarbamoyl)oxymethyl, [N-(2-chloroethyl)-carbamoyl]oxymethyl, (N-phenylcarbamoyl)oxymethyl, (N-p-sulfophenylcarbamoyl)oxymethyl, p-carboxymethylphenylcarbamoyloxymethyl, methoxycarbonyloxymethyl, isobutanoyloxymethyl, cyclobutylcarbonyloxymethyl, carbamoylthiomethyl, (ethoxythiocarbonyl)thiomethyl, (n-propoxythiocarbonyl)thiomethyl, (cyclopentanoxythiocarbonyl)thiomethyl, N,N-diethylthiocarbamoylthiomethyl, N-methylpiperazinium-1-thiocarbonylthiomethyl, N,N-dimethylpiperzinium-1-thiocarbonylthiomethyl, 2-furoylthiomethyl, isothiouroniummethyl, (5-methyl-1,3,4-thiadiazol-2-yl)thiomethyl, p-tolylsulfonylthiomethyl, mesyloxymethyl, 1-methyl-1,2,3,4-tetrazolyl-5-thiomethyl, tosyloxymethyl, sulfamoyloxymethyl, 1-naphthoyloxymethyl, 2-furylacetoxymethyl, cinnamoyloxymethyl, p-hydroxycinnamoyloxymethyl, p-sulfocinnamoyloxymethyl and 1R:2S-epoxypropylphosphonyloxymethyl, or pyridinium methyl; and acylamido is



wherein n is 0–4, Z is oxygen or sulfur, and R″ is benzyl, p-hydroxybenzyl, 4-amino-4-carboxybutyl, methyl, cyanomethyl, 2-pentenyl, n-amyl, n-heptyl, ethyl, 3- or 4-nitrobenzyl, phenethyl, β,β-diphenylethyl, methyldiphenylmethyl, triphenylmethyl, 2-methoxyphenyl, 2,6-dimethoxyphenyl, 2,4,6-trimethoxyphenyl, 3,5-dimethyl-4-isoxazolyl, 3-butyl-5-methyl-4-isoxazolyl, 5-methyl-3-phenyl-4-isoxazolyl, 3-(2-chlorophenyl)-5-methyl-4-isoxazolyl, 3-(2,6-dichlorophenyl)-5-methyl-4-isoxazolyl, D-4-amino-4-carboxybutyl, D-4-N-benzoylamino-4-carboxy-n-butyl, p-aminobenzyl, o-aminobenzyl, m-aminobenzyl, (3-pyridyl)methyl, 2-ethoxy-1-naphthyl, 3-carboxy-2-quinoxalinyl, 3-(2,6-dichlorophenyl)-5-(2-furyl)-4-isoxazolyl, 3-phenyl-4-isoxazolyl, 5-methyl-3-(4-guanidinophenyl)-4-isoxazolyl, 4-guanidinomethylphenyl, 4-guanidinomethylbenzyl, 4-guanidinobenzyl, 4-guanidinophenyl, 2,6-dimethoxy-4-guanidinophenyl, o-sulfobenzyl, p-carboxymethylbenzyl, p-carbamoylmethylbenzyl, m-fluorobenzyl, m-bromobenzyl, p-chlorobenzyl, p-methoxybenzyl, 1-naphthylmethyl, 3-isothiazolylmethyl, 4-isothiazolylmethyl, 5-isothiazolylmethyl, 4-pyridylmethyl, 5-isoxazolylmethyl, 4-methoxy-5-isoxazolylmethyl, 4-methyl-5-isoxazolylmethyl, 1-imidazolylmethyl, 2-benzofuranylmethyl, 2-indolylmethyl, 2-phenylvinyl, 2-phenylethynyl, 2-(5-nitrofuranyl)vinyl, phenyl, o-methoxyphenyl, o-chlorophenyl, o-phenylphenyl, p-aminomethylbenzyl, 1-(5-cyanotriazolyl)methyl), difluoromethyl, dichloromethyl, dibromomethyl, 1-(3-methylimidazolyl)methyl, 2- or 3-(5-carboxymethylthienyl)-methyl, 2- or 3-(4-carbamoylthienyl)methyl, 2- or 3-(5-methylthienyl)methyl, 2- or 3-(5-methoxythienyl)methyl, 2- or 3-(4-chlorothienyl)methyl, 2- or 3-(sulfothienyl)methyl, 2- or 3-(5-carboxythienyl)methyl, 3-(1,2,5-thiadiazolyl)methyl, 3-(4-methoxy-1,2,5-thiadiazolyl)methyl, 2-furylmethyl, 2-(5-nitrofuryl)methyl, 3-furylmethyl, 2-thienylmethyl, 3-thienylmethyl, and tetrazolylmethyl; and the pharmaceutically acceptable salts thereof, or the carboxylic acid protecting derivatives thereof wherein the derivative group is methyl, t-butyl, trichloroethyl, allyl, propargyl, benzyl, diphenylmethyl, o-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, acetoxymethyl, pivaloyloxymethyl, phenacyl, trichloroethoxy carbonyl, trimethylsilyl or tributyltin.

4,297,489

7-α-AMINO-SUBSTITUTED ACYLAMINO-3-(1-CARBOXYMETHYLTETRAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

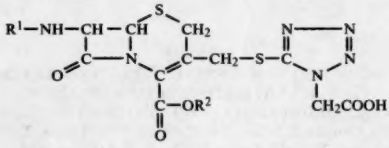
William J. Gottstein, Fayetteville; Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 502,991, Sep. 3, 1974, abandoned. This application Jun. 27, 1975, Ser. No. 590,971

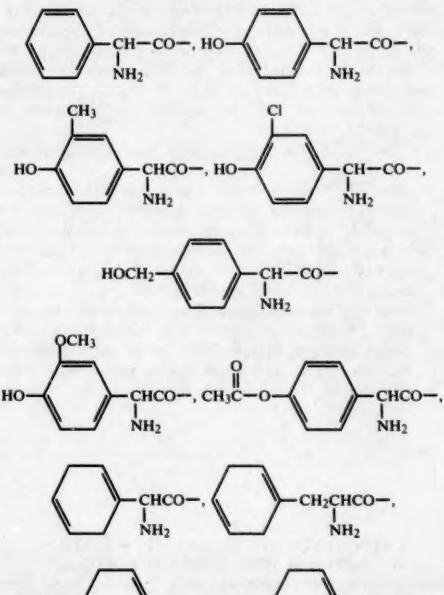
Int. Cl.[3] **C07D** *501/54, 501/56;* **A61K** *31/545*

U.S. Cl. 544—27 **15 Claims**

1. A compound of the formula



wherein R^2 is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl and having the D configuration in the 7-side chain wherein R^1 has the structure



4,297,490
BICYCLIC HETEROCYCLIC AMINO DERIVATIVES

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

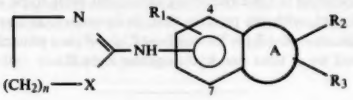
Continuation of Ser. No. 869,209, Jan. 13, 1978, abandoned. This application Feb. 22, 1979, Ser. No. 14,213

Claims priority, application Switzerland, Jan. 14, 1977, 463/77

Int. Cl.[3] **C07D** *277/08, 268/08*

U.S. Cl. 544—55 **24 Claims**

1. A compound having the formula



wherein

X is oxygen or sulfur, the heterocyclic amino moiety is bonded to the benzene ring of the bicyclic moiety,

n is an integer 1 or 2,

R_1, which is bonded to the benzene ring of the bicyclic moiety, is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkylthio, C_{1-4}alkoxy, trifluoromethyl or hydroxy,

A is a five-membered heterocyclic ring selected from the group consisting of [b]pyrrole, [c]pyrrole, [d]triazole, [b]furan, [c]furan, [c]fu.azan, [d](1,2,3)-thiadiazole, [b]pyrroline, [c]pyrroline, [b]dihydrofuran, [c]dihydrofuran, [b]dihydrothiophene, [c]isoxazole and [d]isoxazole,

R_2, which is bonded to the A ring of the bicyclic moiety and attached to a carbon atom of said ring, is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, C_{1-4}alkylthio, trifluoromethyl or hydroxy, and

R_3, which is bonded to the A ring of the bicyclic moiety and attached to a nitrogen atom of said ring, is hydrogen or C_{1-4}alkyl, with the provisos that:

(i) when A is [c]pyrrole, the nitrogen atom is C_{1-4}alkyl-substituted, and

(ii) when A is [b]furan, X is oxygen and n is 1, the oxazolinylamino group is attached to either the 4- or 7-position of the bicyclic moiety,

said compound being in free base or in pharmaceutically acceptable acid addition salt form.

4,297,491
PREPARATION OF 2,3-DIOXO-1,4-BENZOXAZINE DERIVATIVES

Gernot Reissenweber, Ludwigshafen, and Dietrich Mangold, Neckargemuend, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

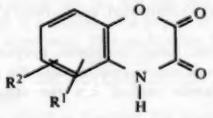
Filed Nov. 3, 1980, Ser. No. 203,447

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944696

Int. Cl.[3] **C07D** *265/32*

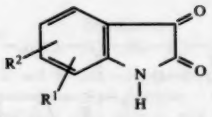
U.S. Cl. 544—105 **3 Claims**

1. A process for the preparation of a 2,3-dioxo1,4-benzoxazine derivative of the formula I



(I)

where R^1 and R^2 are identical or different and each is hydrogen, alkyl, halogen, haloalkyl, alkoxy, haloalkoxy or nitro, wherein an isatin of the formula II



(II)

where R^1 and R^2 have the above meanings, is oxidized with a peroxydisulfate, dissolved or suspended in 30–98% strength sulfuric acid.

4,297,492
PHENOLIC-1,3,5-TRIAZINES

Michael Rasberger; Siegfried Rosenberger, and Samuel Evans, all of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

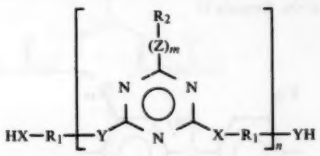
Filed Mar. 10, 1980, Ser. No. 128,987

Claims priority, application Switzerland, Mar. 23, 1979, 2739/79

Int. Cl.[3] **C07D** *251/46, 251/48, 251/70, 251/26*

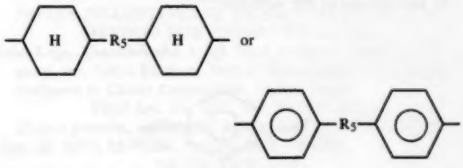
U.S. Cl. 544—211 **8 Claims**

1. A compound of the general formula I

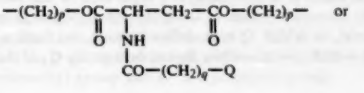


(I)

in which X, Y and Z independently of one another are —O—, —S— or —N(R_3)—, in which R_3 can be hydrogen, —NH_2, C_1–C_{18} alkyl, C_2–C_{18} oxaalkyl, C_2–C_{18} thiaalkyl, C_3–C_6 alkenyl, C_3–C_4 alkynyl, C_5–C_{12} cycloalkyl, C_6–C_{14} aryl, which is unsubstituted or substituted by C_1–C_8 alkyl, or C_7–C_{18} aralkyl, which can be substituted in the aryl moiety by —OH and C_1–C_8 alkyl, R_1 is C_2–C_{18} alkylene which can be interrupted by one or two —O—, —S— or —COO— or by one —O—P(R-4)—O—, in which R_4 is C_1–C_{18} alkyl, allyl, cyclohexyl or phenyl, or C_5–C_{12} cycloalkylene, C_3–C_4 alkenylene, phenylene, biphenylene, 1,4-cyclohexylenedimethylene, 1,3,3-trimethylcyclohexylene or one of the two groups of the formulae



in which R_5 is —O—, —S—, —NH— or —(R_6)C(R_7)—, in which R_6 and R_7 are hydrogen or C_1–C_8 alkyl, or R_6 and R_7 together with the C atom to which they are bonded form C_5–C_{12} cycloalkylene, or, furthermore, if X and Y are —N(R-3)—, R_1 is a direct bond or, together with the two radicals —N(R_3)—, forms a piperazine ring which can be substituted by C_1–C_4-alkyl, and if X and Y are —N(R_3)— or —S—, R_1 can be one of the three bivalent groups of the formulae



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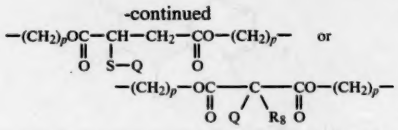
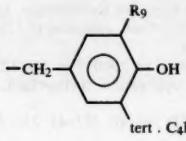
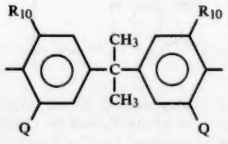


in which R_8 is C_1–C_{18} alkyl, C_3–C_6 alkenyl, C_5–C_{12} cycloalkyl, phenyl, benzyl or Q, and Q is a group of the formula

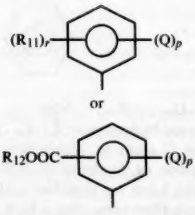


in which R_9 is C_1–C_8 alkyl, and p is the numbers 1-3 and q is the number 1 or 2, or, furthermore, if X and Y are —O—, R_1 is a group of the formula II

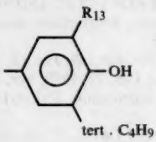


II

in which Q is as defined above and R_{10} is C_1–C_{18}alkyl, C_3–C_6 alkenyl, C_5–C_{12} cycloalkyl, phenyl, benzyl, Q or α,α-dimethylbenzyl, and R_2 is hydrogen, C_1–C_{18} alkyl, C_2–C_{18} oxaalkyl, C_2–C_{18} thiaalkyl, C_3–C_{19} alkoxycarbonylalkyl, C_3–C_6 alkenyl, C_3–C_4 alkynyl, C_5–C_{12} cycloalkyl, C_6–C_{14} aryl, which is unsubstituted or substituted by C_1–C_8 alkyl, C_7–C_{23} alkaryl, which can be substituted in the aryl moiety by —OH, or C_7–C_{18} aralkyl which can be interrupted in the alkylene moiety by —S— or —COO— and can be substituted in the aryl moiety by —OH and C_1–C_8 alkyl, or, if Z is —O—, R_2 can be one of the two groups of the formulae



in which Q, p and q are as defined above, R_{11} is C_1–C_8 alkyl, R_{12} is C_1–C_{18} alkyl or phenyl and r is the number nought, 1 or 2 and, furthermore, if Z is —N(R_3)—, R_2 is one of the two groups of the formulae —NH—CO—CH_2—Q or NH—Q, or p-anilinophenyl, in which Q is as defined above, or, furthermore, if Z is —N(R_3)— or —O—, R_2 can be a group Q_1 of the formula



in which R_{13} is C_1–C_4 alkyl and, if m is nought, R_2 can also be halogen, and m is nought or 1 and n is the numbers 2–200, it being possible for the recurring structural units to be identical or different, with the proviso that, in formula I, at least one of the radicals —X—R_1—Y— and —(Z)$_m$—R_2 is a phenol radical hindered by at least one hydrocarbon radical.

4,297,493

MANUFACTURE OF 4-AMINO-5-CHLORO-1-PHENYLPYRIDAZ-6-ONE USING AQUEOUS PHENOL-4-SULFONIC ACID

Winfried Richarz; Helmut Froehlich, and Harald Schroeder, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 185,403

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937421

Int. Cl.[3] **C07D** *237/14*

U.S. Cl. 544—241 **2 Claims**

1. A process for the manufacture of substantially pure 4-amino-5-chloro-1-phenylpyridaz-6-one by reaction of 4,5-dichloro-1-phenylpyridaz-6-one with ammonia, wherein the reaction is carried out with an aqueous solution of ammonia, at from 20° to 200° C. and from 1 to 20 bars, in the presence of phenol-4-sulfonic acid.

4,297,494

XANTHINE TRACERS

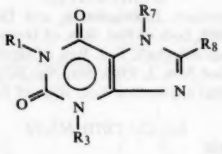
Ernest V. Groman, Somerville, and Michael D. Cabelli, Waltham, both of Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 9, 1978, Ser. No. 932,146

Int. Cl.[3] **C07D** *473/08, 473/12*

U.S. Cl. 544—267 **12 Claims**

1. Radioiodinatable xanthine derivatives having the formula:



wherein

(a) R_1 is an imidazole, pyrrole, thiophene, indole or polyunsaturated alkenyl radical;

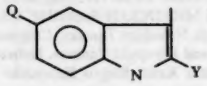
(b) R_3 is a hydroxy-substituted, unsaturated cyclic hydrocarbon radical;

(c) R_7 is a pyrrole, furan, thiophene, polyunsaturated alkenyl, imidazole or indole radical, with the proviso that

(1) the imidazole radical has the structure —L(X)$_n$ wherein

L is a linking group containing at least one ester, ether, amide or amino bond, X is imidazole and n ranges from 1 to about 10; and

(2) the indole radical has the structure:



wherein Q is hydrogen or hydroxyl and Y is hydrogen, halo or lower alkyl up to about 7 carbon atoms; and

(d) R^8 is a pyrrole, furan or imidazole radical wherein the imidazole radical is set forth in part (c) (1);

with the further proviso that no more than two of R_1, R_3, R_7 or R_8 are the above radicals and that if R_1, R_3, R_7 or R_8 are not one of the above radicals then R_1 is hydrogen, acetate or methyl; R_3 is methyl; R_7 is hydrogen, acetate or methyl; and R_8 is hydrogen.

4,297,495

PREPARATION OF 2-ISOPROPYLAMINO PYRIMIDINE

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Jun. 30, 1980, Ser. No. 164,889

Claims priority, application United Kingdom, Aug. 9, 1979, 27811/79

Int. Cl.³ C07D *239/42*

U.S. Cl. 544—330 **1 Claim**

1. Process for the preparation of 2-isopropylamino pyrimidine comprising reacting bis (isopropylguanidine) sulphate with 1,1,3,3-tetraethoxy-propane in stoichiometric proportions at 40°–60° C., in acidic aqueous solution.

4,297,496

NITRIMINE DERIVATIVES

Royston H. Davis, Sittingbourne, and John H. Davies, Canterbury, both of England, assignors to Shell Oil Company, Houston, Tex.

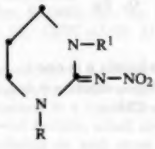
Filed Jun. 23, 1980, Ser. No. 162,340

Claims priority, application United Kingdom, Jul. 30, 1979, 26479/79

Int. Cl.³ C07D *239/18*

U.S. Cl. 544—332 **4 Claims**

1. A nitriminoheterocyclic compound of the general formula:



wherein R is hydrogen, alkyl of from one to six carbon atoms or alkanoyl of up to seven carbon atoms, and R^1 is hydrogen or alkyl of from one to six carbon atoms.

4,297,497

SYNTHESIS OF 2-KETO-1,4-DIAZACYCLOALKANES

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company

Continuation-in-part of Ser. No. 916,640, Jun. 19, 1978, Pat. No. 4,167,512, which is a continuation-in-part of Ser. No. 835,066, Sep. 21, 1977, abandoned. This application Jul. 13, 1979, Ser. No. 57,238

Int. Cl.³ C07D *241/08*

U.S. Cl. 544—384 **5 Claims**

1. A method which is directive for preparing symmetrical polysubstituted 2-keto-1,4-diazacycloalkanes, said method comprising:

contacting a 1,2-diamine, a saturated monoketone and haloform in the presence of aqueous or solid alkali and a catalytic effective amount of a phase transfer catalyst of the formula

R—O—R'

wherein R and R' are independently selected from the group consisting of alkyl having 1 to 16 carbon atoms and substituted alkyl wherein said substituents can be hydroxy, sulfur, amine or ether.

4,297,498

4-TERTIARY-AMINO-2,6-DIAMINOPYRIDINE 1-OXIDES

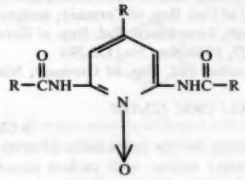
John E. Lawson, and Ronald D. Dennis, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 873,294, Jan. 30, 1978, Pat. No. 4,182,888, which is a division of Ser. No. 773,041, Feb. 28, 1977, Pat. No. 4,080,500, which is a division of Ser. No. 638,473, Dec. 8, 1975, Pat. No. 4,021,562. This application Aug. 23, 1979, Ser. No. 68,983

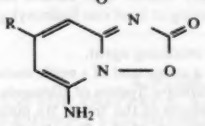
Int. Cl.³ C07D *411/12, 498/04, 401/12*

U.S. Cl. 546—116 **3 Claims**

1. A compound having Formula IV or Formula V



Formula IV



Formula V

wherein R is selected from the group consisting of diethylamino, pyrrolidino, piperidino, morpholino, thiomorpholino, and N-methylpiperazino.

3. The compound according to claim 1 which is 5-amino-7-(piperidinyl)-2H-[1,2,4]oxadiazolo[2,3-a]pyridin-2-one.

4,297,499

NOVEL DISUBSTITUTED DICHLOROSILANE AND METHOD FOR PRODUCING SAME

Isao Koga, Yokohamashi; Yohji Terui, Chibashi; Masuhito Ohgushi, and Tohru Kitahara, both of Minamatashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 11, 1978, Ser. No. 895,332

Claims priority, application Japan, Apr. 12, 1977, 52-41686; Jun. 30, 1977, 52-78186; Jan. 24, 1978, 53-6584

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—465 **11 Claims**

1. A disubstituted dichlorosilane having the general formula

(I)

wherein R' is an alkyl group having 2~3 carbon atoms and R'' is an alkyl group having 8~20 carbon atoms, or R' is an alkyl group having 4~20 carbon atoms and R'' is an alkyl group having 5~20 carbon atoms which is different from R', or R' is phenethyl group and R'' is cyclohexyl group.

4,297,500

CONVERSION OF LOW-BOILING CONSTITUENTS FROM ALKYL-CHLOROSILANE SYNTHESIS

Ulrich Finke, Ettlingen, and Hans-Heinrich Moretto, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,932

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950402

Int. Cl.³ C07F 7/08

U.S. Cl. 556—466 4 Claims

1. A process for converting the low-boiling constituents formed in the preparation of methylchlorosilane in the Müller-Rochow process and which consist essentially of tetramethylsilane, dimethylmonochlorosilane and 2-methylbut-2-ene into a product mixture consisting essentially of trimethylchlorosilane, dimethylchlorosilane and C_{2-20} alkyldimethylchlorosilanes or C_{6-10}-aryldimethylchlorosilanes, comprising contacting the low-boiling product mixture with $AlCl_3$, AlOCl and/or $AlBr_3$, together with hydrogen chloride, in the liquid phase at about 40° to +25° C.

4,297,501

PROCESS FOR THE PREPARATION OF URETHANES

Robert Becker; Johann Grolig, both of Leverkusen, and Christian Rasp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,394

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908251

Int. Cl.³ C07C 125/065

U.S. Cl. 560—24 9 Claims

1. A heat efficient process for the preparation of urethanes comprising reacting primary amines with carbon monoxide and organic compounds having at least one hydroxyl group in the presence of

(a) molecular oxygen as oxidizing agent,

(b) a noble metal and/or a compound of a noble metal of the 8th subgroup of the Periodic System of Elements, and

(c) a compound of an element of the 3rd to 5th main group and/or 1st to 8th subgroup of the Periodic System of Elements, said compound being capable of undergoing Redox reactions under the reaction conditions.

4,297,502

AROMATIC BISAZOMETHINES, A METHOD FOR THEIR PREPARATION, AND THEIR USE AS REACTIVE PIGMENTS

Hans-Joachim Herrmann; Günther Meyer, both of Troisdorf, and Klaus-Dieter Steffen, Hennef, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

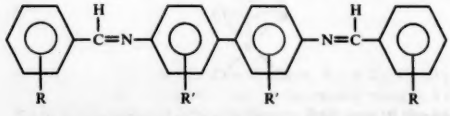
Filed Jun. 19, 1980, Ser. No. 161,182

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2924964

Int. Cl.³ C07C 101/68, 119/10

U.S. Cl. 560—35 12 Claims

1. An aromatic bisazomethine prepared from disubstituted benzidines and aromatic aldehydes, characterized by the general formula



wherein

each R=$COOCH_3$, $COOC_2H_5$, COOH, CH_2Cl, $CHCl_2$, CH_2Br, CCl_3, Cl or Br and

each R'=Cl, OCH_3 or CH_3.

4,297,503

NOVEL BENZAMIDE DERIVATIVE AND METHOD OF PREPARING METOCLOPRAMIDE USING SAME

Joji Nishikido, Fuji; Nobuhiro Tamura, Chigasaki; Yohei Fukuoka, Kurashiki, and Hiroyuki Yamane, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

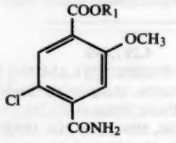
Division of Ser. No. 58,809, Jul. 19, 1979, Pat. No. 4,250,110. This application Sep. 26, 1980, Ser. No. 190,994

Claims priority, application Japan, Jul. 31, 1978, 53/92564

Int. Cl.³ C07C 101/74

U.S. Cl. 560—42 2 Claims

1. 2-Chloro-4-carboalkoxy-5-methoxybenzamide of the formula (II),



(II)

wherein R_1 is a C_{1-7} alkyl group, a C_{1-7} haloalkyl group or a phenyl group.

4,297,504

19-HYDROXY-6A-CARBA-PGI₂ COMPOUNDS

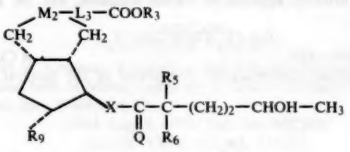
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508. This application Mar. 3, 1980, Ser. No. 126,471

Int. Cl.³ C07C 177/00

U.S. Cl. 560—119 1 Claim

1. A prostacyclin-type compound of the formula



wherein L_3 is

(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,

(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or

(3) $-CH_2-CH=CH-$;

wherein M_2 is

(1)

(2)

wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_3 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH—N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{16},
wherein —(Ph)—is inter-phenylene and —(p-Ph)—is inter-para-phenylene or para-phenyl;
wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein R_9 is hydrogen or hydroxyl; and
wherein X is
(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

4,297,505

PROCESS FOR THE PREPARATION OF PENTACHLORO-3-BUTENOIC ACID ESTERS

Günther Maahs, and Konrad Rombusch, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,617
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925012
Int. Cl.³ C07C *69/65*
U.S. Cl. 560—219 **11 Claims**

1. A process for preparing a pentachloro-3-butenoic acid alkyl ester which comprises reacting the corresponding 1-alkoxyheptachloro-3-butene with an aqueous solution of an alkali metal carbonate.

4,297,506

SYNTHESIS OF ESTERS

Kiplin D. Cowan, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jan. 8, 1980, Ser. No. 110,302
Int. Cl.³ C07C *67/04, 31/20*
U.S. Cl. 560—246 **4 Claims**

1. In a process for producing a diacetoxyalkene from a conjugated diene, a halogen, an alkali metal acetate, and an acid wherein there is obtained in a reaction zone a reaction mass comprising alkali metal acetate, alkali metal halide, acid, and diacetoxyalkene occluded in said mass in the salts therein which cannot be separated by distillation of the non-occluded diacetoxyalkene from said mass, the steps of (1) distilling non-occluded diacetoxyalkene, and (2) recycling to the reaction zone at least a portion of said mass containing said occluded diacetoxyalkene whereby the yield of diacetoxyalkene from said reaction zone and said distillation is increased.

4,297,507

PROCESS AND APPARATUS FOR PRODUCING TEREPHTHALIC ACID WITH HIGH PURITY

Makoto Komatsu; Yuji Takamizawa, and Tazuo Ohta, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Co. Inc., Tokyo, Japan

Continuation of Ser. No. 9,963, Feb. 6, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,106
Claims priority, application Japan, Feb. 20, 1978, 53-17649
Int. Cl.³ C07C *51/16*
U.S. Cl. 562—416 **13 Claims**

1. A process for producing terephthalic acid of high purity suitable for direct polymerization by oxidizing p-tolualdehyde at 180°–280° C. with a gas containing molecular oxygen in a solvent consisting of water in the presence of bromine ions, the concentration of the bromine ions being 0.5–12% by weight on the basis of the solvent, in a reactor using zirconium or a zirconium alloy as a reactor material.

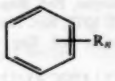
4,297,508

PROCESS FOR PRODUCING 2 HYDROXY-NAPHTHALENE-3-CARBOXYLIC ACID

Yuzo Maegawa, Oita; Fujio Masuko, Oita, and Makoto Nakamura, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 22, 1980, Ser. No. 218,973
Claims priority, application Japan, Dec. 25, 1979, 54-170056; Sep. 22, 1980, 55-132033
Int. Cl.³ C07C *51/15*
U.S. Cl. 562—425 **14 Claims**

1. A process for producing 2-hydroxynaphthalene-3-carboxylic acid comprising reacting carbon dioxide with a homogeneous liquid mixture comprising an alkali metal salt of β-naphthol, β-naphthol and an alkylbenzene of the formula (I):



(I)

wherein R is the same or different and is a straight or branched alkyl group having 1 to 4 carbon atoms and n is an integer of 1 to 6.

4,297,509

PROCESS FOR PREPARING ALKALI METAL SALTS 3-AMINO-2, 5-DICHLOROBENZOIC ACID

Bertrand A. Chiasson, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 25, 1980, Ser. No. 133,787
Int. Cl.³ C07C *51/347*
U.S. Cl. 562—456 **8 Claims**

1. A process for producing alkali metal salt of 3-amino-2,5-dichlorobenzoic acid in high yield comprising reacting alkali metal salt of 3-nitro-2,5-dichlorobenzoic acid with hydrogen under pressure at an elevated temperature in the presence of a molybdenum-promoted Raney nickel catalyst, said reaction being effected at a pH between about 6 and 12, and said reaction being effected in the presence of a water solvent.

4,297,510

UNSYMMETRICAL DIPHOSPHATETRAAZACYCLOOCTATETRAENES

Kazimiera J. L. Paciorek, Corona Del Mar; Reinhold H. Kratzer, Irvine; Thomas I. Ito, Fountain Valley, and James H. Nakahara, Irvine, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 26, 1980, Ser. No. 163,135
Int. Cl.³ C07F *9/22*; C10M *1/44*
U.S. Cl. 564—13 **2 Claims**

1. The compound 1,3-bis(diphenylphospha)-5,7-bis[CF(CF_3)OC_3F_7]-2,4,6,8-tetraazacyclooctatetraene.

2. The compound 1,3-bis(diphenylphospha)-5,7-bis [$CF(CF_3)OCF_2CF(CF_3)OC_3F_7$]-2,4,6,8-tetraazacyclooctatetraene.

4,297,511

METHOD FOR THE MANUFACTURE OF POLYARYLAMINES HAVING METHYLENE BRIDGES

Efim Biller, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 4, 1979, Ser. No. 72,313

Claims priority, application Switzerland, Sep. 12, 1978, 9537/78

Int. Cl.³ C07C *87/28*

U.S. Cl. 564—331 **16 Claims**

1. A method of making simultaneously monomeric 4,4′-methylene diarylamine and polyamines which comprises the steps of

condensing formaldehyde with a highly protonized aniline salt solution containing at least perfluoro-carbonic acid to obtain a homogeneous aqueous solution; and

cooling the homogeneous solution in a given temperature range to crystallize and precipitate 4,4′-methylene diarylamine as a salt and to leave substantially the other condensed arylamines as salts in the residual liquid.

4,297,512

PROCESS FOR THE PREPARATION OF TRIETHYLAMINE

Klaus Mainusch; Bernhard Schleppinghoff, and Klaus Munter, all of Dormagen, Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,849

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839135

Int. Cl.³ C07C *85/12*

U.S. Cl. 564—490 **14 Claims**

1. In a process for the continuous preparation of triethylamine by catalytic hydrogenation of acetonitrile in the gas phase, the improvement which comprises employing as the catalyst a catalyst comprising a noble metal of Group VIII of the periodic system disposed on a lithium aluminum spinel catalyst, employing a temperature of 80° to 115° C. and a pressure of 1 to 60 bars gauge and carrying out the process in the presence of up to 3% by weight of monoethylamine and/or diethylamine relative to acetonitrile.

4,297,513

PROCESS FOR THE PREPARATION OF BENZOPHENONE THIOETHERS

Louis Felder, Basel, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 39,465, May 16, 1979, abandoned. This application May 28, 1980, Ser. No. 153,985

Int. Cl.³ C07C *148/00, 149/32*

U.S. Cl. 568—43 **1 Claim**

1. A process for the preparation of 4-(2-hydroxyethyl-mercapto)-benzophenone by reacting 4-chlorobenzopheone with 2-hydroxyethyl mercaptan in dimethylacetamide or dimethylformamide at 80° to 140° C. in the presence of an alkali metal carbonate or alkali metal hydroxide in an amount equivalent to the amount of 4-chlorobenzophenone.

4,297,514

METHOD OF OXIDIZING COMPOUNDS HAVING ACTIVATED METHYLENE RADICALS

King W. Ma, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 972,850, Dec. 26, 1978, abandoned. This application Mar. 14, 1980, Ser. No. 130,325

Int. Cl.³ C07C *45/36, 45/28*

U.S. Cl. 568—321 **14 Claims**

1. In a method for oxidizing fluorene to fluorenone comprising contacting fluorene with an oxidizing agent and an aqueous solution of a base of sufficient strength to deprotonate hydrogen from a —CH_2— radical of the fluorene in the presence of a catalyst, the improvement comprising using as the catalyst a synergistic combination of:

(1) a member from the group consisting of charcoal, graphite, carbon black, coke, activated carbon and mixtures thereof; and

(2) a phase transfer catalyst.

4,297,515

DIKETONES USEFUL AS LIQUID CRYSTALS

Rudolf Eidenschink, Dieburg, and Ludwig Pohl, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

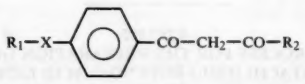
Filed May 9, 1980, Ser. No. 148,353

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918775

Int. Cl.³ C07C *49/813, 49/792*

U.S. Cl. 568—329 **7 Claims**

1. A diketone of the formula



wherein R_1 is alkyl, perfluoroalkyl or alkoxy, each of 1–18 carbon atoms; R_2 is alkyl of 1–12 carbon atoms; and X is 1,4-trans-cyclohexylene, 1,4-phenylene or 4,4′-cyclohexylphenyl.

4,297,516

1-SUBSTITUTED-1-OXO-PROSTANE-DERIVATIVES OF THE E, A AND F SERIES

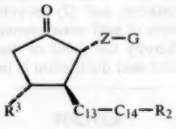
Allan Wissner, Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 3,953, Jan. 16, 1979, Pat. No. 4,254,285, which is a continuation-in-part of Ser. No. 961,032, Nov. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 858,589, Dec. 8, 1977, Pat. No. 4,202,822, Ser. No. 858,588, Dec. 8, 1977, Pat. No. 4,170,597, Ser. No. 858,580, Dec. 8, 1977, Pat. No. 4,197,245, Ser. No. 858,487, Dec. 8, 1977, abandoned, Ser. No. 858,504, Dec. 8, 1977, Pat. No. 4,172,839, and Ser. No. 858,579, Dec. 8, 1977, Pat. No. 4,212,969. This application Jun. 7, 1979, Ser. No. 46,721

Int. Cl.³ C07C *177/00*

U.S. Cl. 568—330 **47 Claims**

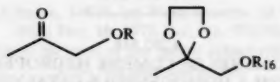
1. An optically active compound of the formula:



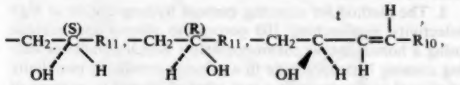
wherein Z is $-(CH_2)_g-$ or

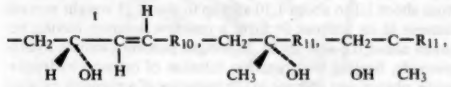
$$-CH_2-CH=CH-(CH_2)_f-$$
cis

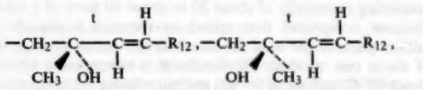
wherein g is an integer from 5 to 7 inclusive, and f is an integer from 2 to 4, inclusive; C_{13}–C_{14} is ethylene or trans-vinylene; R_3 is hydrogen or hydroxyl; G is selected from the group consisting of:

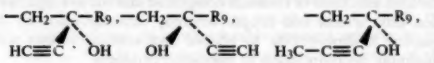


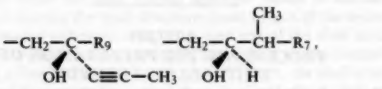
wherein R is C_1–C_6 alkyl, phenyl or phenyl substituted with one or more substituents selected from the group consisting of C_1–C_4 alkyl, —OR_{15}, —SR_{15}, Fl or Cl wherein R_{15} is C_1–C_4 alkyl; R_{16} is C_1 to C_6 alkyl; R_2 is selected from the group consisting of:

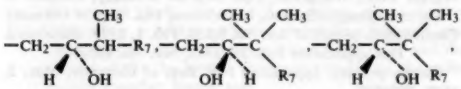


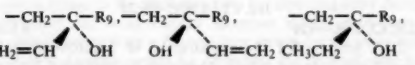


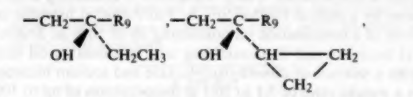


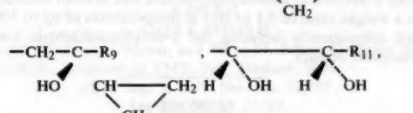


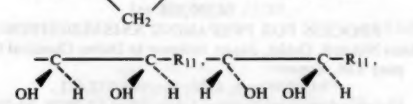


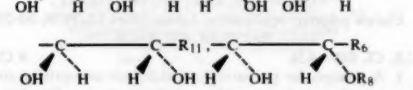


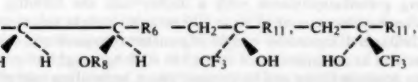


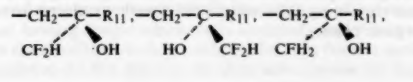


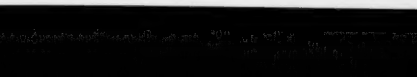












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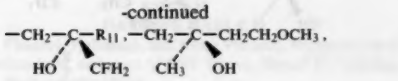

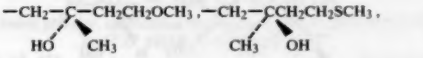

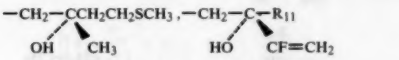

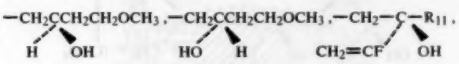

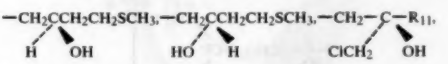

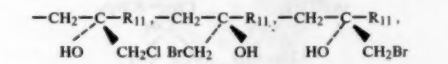

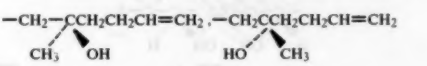

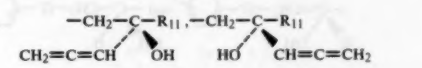

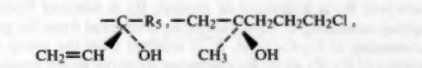

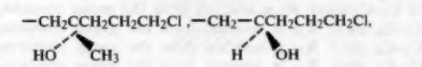

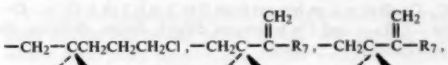

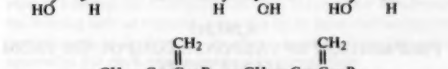

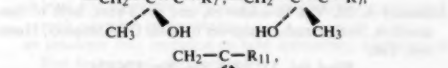

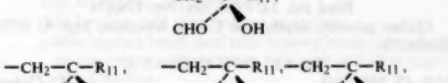

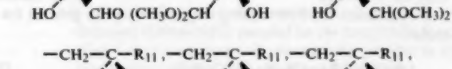

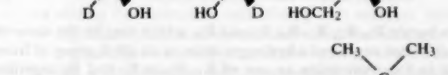

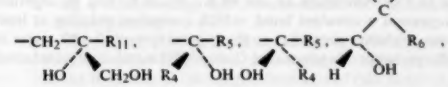

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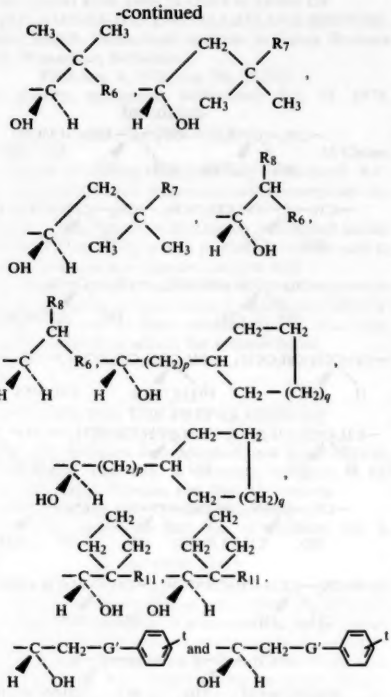


wherein R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4–C_7 alkyl; R_6 is selected from the group consisting of C_3–C_6 alkyl; R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_9 is selected from the group consisting of C_3–C_6 alkyl; R_{10} is selected from the group consisting of C_1–C_4 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; R_{12} is selected from the group consisting of C_1–C_4 alkyl; p is an integer from 0 to 3; q is 1 or 2; G′ is —O— or —CH_2—; and t is hydrogen, chloro, fluoro, dichloro, trifluoremethyl or methoxy.

4,297,517

PREPARATION OF CARBONYL COMPOUNDS FROM ALLYLETHERS

Johannes A. M. Van Broekhoven, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 31, 1980, Ser. No. 174,074

Claims priority, application United Kingdom, Sep. 4, 1979, 30594/79

Int. Cl.³ C07C *45/59, 45/42*

U.S. Cl. 568—361 **11 Claims**

1. A process for hydrolysing allylethers of the general formula:

$$R_6CH{=}CR_5{-}CR_4H{-}O{-}CR_1R_2R_3 \quad (I)$$

wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, represent a hydrogen atom or an alkyl group of from 1 to 8 carbon atoms or one of R_1, R_2 or R_3 and R_6 together represent a covalent bond, which comprises reacting at least one allylether according to the general formula I with water in the presence of a supported Group VIII metal catalyst selected from the group consisting of platinum, palladium, rhodium and iridium.

4,297,518

DECOMPOSITION OF CUMENE HYDROPEROXIDE WITH A HOMOGENEOUS CATALYST

Ching-Yong Wu, O'Hara Township, Allegheny County; Wayne R. Pretzer, Oakmont, and Thaddeus P. Kobylinski, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 18, 1977, Ser. No. 852,923

Int. Cl.³ C07C *27/00, 45/00, 49/08, 39/04*

U.S. Cl. 568—385 **11 Claims**

1. The method for cleaving cumene hydroperoxide at high selectivity approaching 100 percent to phenol and acetone using a homogeneous rhenium catalyst which comprises adding cumene hydroperoxide to a solution consisting essentially of phenol and acetone at a mol ratio of phenol to acetone of from about 1:1 to about 1:10 and up to about 15 weight percent cumene in an amount to form a reaction solution having between about 0.1 and about 20 weight percent cumene hydroperoxide, heating said reaction solution of cumene hydroperoxide, phenol and acetone in the presence of a rhenium catalyst consisting essentially of about 20 to about 60 parts of a soluble rhenium compound determined as rhenium heptoxide per million parts of the total reaction mixture for an average time of about one to about 60 minutes at a temperature between about 40° C. and about 80° C., and correlating the temperature, the concentration of rhenium compound and the average reaction time within said ranges whereby decomposition of the cumene hydroperoxide to phenol and acetone results with minimum decomposition to undesired products.

4,297,519

PROCESS FOR THE PREPARATION OF 2-NITROBENZALDEHYDE

Werner Ertel, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 8,633, Feb. 1, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,617

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808930

Int. Cl.³ C07C *45/28*

U.S. Cl. 568—424 **2 Claims**

1. A process for the preparation of 2-nitrobenzaldehyde from 2-nitrotoluene which comprises brominating 2-nitrotoluene by a radical mechanism, to 2-nitrobenzyl bromide in the form of a bromination oil containing 20 to 50% of 2-nitrobenzyl bromide, and then oxidizing said bromination oil directly with a mixture of dimethylsulphoxide and sodium bicarbonate in a weight ratio of 3:1 to 10:1 at temperatures of up to 100° C. and subsequently isolating the 2-nitrobenzaldehyde via the bisulphite adduct.

4,297,520

PROCESS FOR PREPARING ANISALDEHYDE

Kozo Nakaoji, Osaka, Japan, assignor to Daiwa Chemical Company Ltd., Japan

Filed Mar. 4, 1980, Ser. No. 127,071

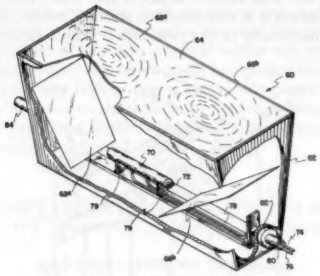
Claims priority, application Japan, Mar. 12, 1979, 54-29067

Int. Cl.³ C07C *45/28*

U.S. Cl. 568—426 **9 Claims**

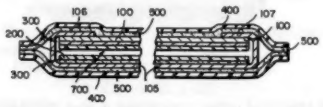
1. A process for preparing anisaldehyde comprising oxidizing p-methoxytoluene with a dichromate ion forming substance in an amount of 30 to 100 parts by weight calculated as CrO_3 per 100 parts by weight of p-methoxytoluene and sulfuric acid in a concentration of about 5 to 40% by weight, to provide an aqueous phase and an organic phase, separating said phases and recovering anisaldehyde and p-methoxytoluene from said organic phase.

4,297,521
FOCUSING COVER SOLAR ENERGY COLLECTOR APPARATUS
Steven A. Johnson, 136 N. 1st West, Preston, Id. 83263
Filed Dec. 18, 1978, Ser. No. 970,762
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ H01L *31/04;* **F24J** *3/02*
U.S. Cl. 136—248 **20 Claims**



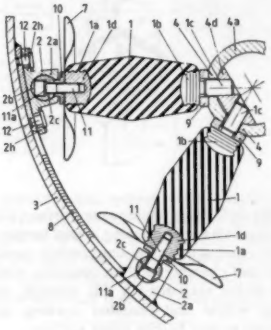
1. A solar collector comprising:
a shell structure, the shell structure having an open top;
first mounting means for the shell structure;
solar energy absorber means inside the shell structure;
second mounting means for the shell structure and supporting the solar energy absorber means coaxially inside the shell structure in a nonrotatable position relative to the sun to thereby accomodate rotational movement of the shell about the solar energy absorber means to accomodate rotating the shell structure about an axis of the second mounting means to orient the open top of the shell structure toward the sun, the second mounting means comprising a first hollow shaft and a second shaft, the shell structure being rotatably mounted on the first hollow shaft and the second shaft, the second mounting means further comprising a bridge structure extending between and substantially aligned with the first hollow shaft and the second shaft, the bridge structure supporting the solar energy absorber means; and
optical means in the shell structure for directing solar energy toward the solar energy absorber means, said optical means comprising a Fresnel lens means for focusing solar flux and mirror means for reflecting the focused solar flux toward the solar energy absorber means, said Fresnel lens means comprising a transparent cover over the open top of the shell structure.

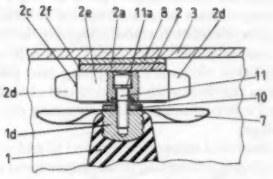
4,297,522
CABLE SHIELD
Harold W. Jesse, Amherst, and Peter M. Jones, Sandown, both of N.H., assignors to TME, Inc., Hudson, N.H.
Filed Sep. 7, 1979, Ser. No. 73,197
Int. Cl.³ H01B *11/10*
U.S. Cl. 174—36 **6 Claims**



1. A cable shielding device comprising a length of a first sheet of self supporting metal foil, said first sheet having longitudinal edge portions, a length of a second sheet of self-supporting metal foil of a width greater than said first sheet, said second sheet having longitudinal edges, portions of said second sheet forming flanges which are in electrical contact with said first sheet surface which it overlies, a first low friction surface coupled to the first sheet on the sheet side opposite the flange of the second sheet, a second low friction surface coupled to said second sheet on the sheet side closest the first low friction surface but not covering the flange portions of the second sheet in electrical contact with the first sheet, and an outer insulating cover surrounding said first and second sheets.

4,297,523
GAS PIPE CABLE
Carl D. Floessel, Fislisbach, and Klaus Floessel, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland
Filed May 21, 1980, Ser. No. 152,148
Claims priority, application Switzerland, Jul. 5, 1979, 6277/79
Int. Cl.³ H01B *9/06;* **H02G** *5/06*
U.S. Cl. 174—27 **16 Claims**





5. In a three phase gas pipe cable having at least one gas pipe cable section and having in said at least one gas pipe cable section three phase conductors arranged within an enclosing pipe in a triangular configuration, said three phase conductors each being held at support locations by at least one supporting insulator at each support location, a conductor supporting apparatus for each phase conductor comprising:
at least one supporting insulator for each phase conductor in each gas pipe cable section;
an insulator foot included on said supporting insulator, said foot facing said enclosing pipe;
a slide bearing, said slide bearing including:
a slide bearing block, said slide bearing block being rigidly connected to said enclosing pipe, and said slide bearing block having:
a bearing block groove, said bearing block groove being disposed substantially parallel to the longitudinal axis of said enclosing pipe and substantially parallel to the longitudinal axis of said phase conductor; and
a sliding bolt member, said sliding bolt member being rigidly connected to said insulator foot included on the supporting insulator, and said sliding bolt member having a free-standing end accommodated in said bearing block groove;
whereby said supporting insulator is capable of motion in the direction of the longitudinal axis of said enclosing pipe and in the direction of the longitudinal axis of said phase conductor.

4,297,524

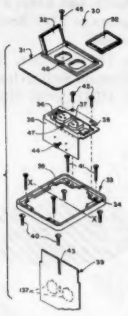
ELECTRICAL ACTIVATING ASSEMBLY AND RECEPTACLE SUPPORT MEANS THEREFOR

Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 26, 1979, Ser. No. 107,411

Int. Cl.³ H02G 3/12

U.S. Cl. 174—48 **13 Claims**



1. A barrier including a barrier outer surface; a chamber in said barrier having a chamber opening at said barrier outer surface; spaced-apart conduit means having conduit openings communicating with said chamber; and an assembly comprising:

rim means presenting a rim opening, said rim means residing within said chamber opening and below but proximate to said barrier outer surface;

a support plate supported in part by said rim means below but proximate to and substantially parallel with said barrier outer surface, said support plate having a central opening and support ears presented at said central opening;

a plate element formed integrally with and extending from one edge of said support plate into said chamber;

a petition element overlapping said plate element and cooperating therewith to divide said chamber into first and second compartments each containing one of said conduit openings;

an electrical receptacle secured to and supported by said support ears within said first compartment and presenting a plug at said barrier outer surface; and

a closure member supported at said barrier outer surface in capping relation with said rim opening.

4,297,525

ELECTRICAL OUTLET BOX AND PAWL MOUNTING DEVICE

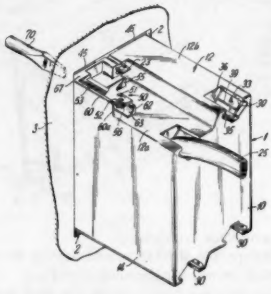
Wade R. Bowden, Jr., Northport, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,992

Int. Cl.³ H02G 3/08

U.S. Cl. 174—58 **14 Claims**

1. An electrical outlet box having a wall structure providing front to rear wall means and a bottom wall interconnected therebetween, the front to rear wall means and bottom wall defining a chamber within the wall structure which opens through the front of the box, said front to rear wall means comprising a pair of opposed side walls and a pair of opposed end walls interconnected between said side walls, each of said side and end walls terminating in a common frontal plane defining the front opening of said box, said box further including electrical fixture mounting post members adjacent the inside surface of each opposed end wall in opposed alignment generally centrally of said end walls, said wall means also defining an outermost periphery of said box and including end wall portions which are recessed inwardly from said periphery and inwardly from the remainder of said end wall so as to define recessed areas extending along said periphery of said box from the front to the rear thereof, said recessed areas in said end walls being in diagonally opposed alignment on opposite sides of said electrical fixture mounting post members, first flange means secured to said front to rear wall means extending laterally outwardly beyond said outermost periphery of said box, pawl means mounted in said recessed areas, said pawl means being rotatably actuable between a retracted position within the confines of said outermost periphery of said box and an extended position beyond said outermost periphery of said box, said pawl means including clamping flange means adapted to engage the wall surface adjacent said wall opening when said pawl means is in said extended position, means restraining rotational movement of said pawl means in both clockwise and



counterclockwise directions in said extended position, said means restraining rotational movement of said pawl means includes a single pawl stop flange member extending in a plane parallel to the plane defined by said pawl arm and pawl tab portions when said pawl means is in said extended position, a hub portion, an arm portion extending tangentially of said hub portion and terminating on one side thereof in said clamping flange means, and a tab portion extending coplanar with said arm portion and terminating on the side of said hub portion opposite said clamping flange means, whereby said pawl means travels linearly both into and out of clamping engagement with said wall surface adjacent said wall opening.

4,297,526

FIRE RESISTANT ELECTRICAL CABLES

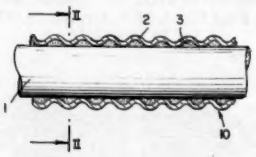
Ottmar Leuchs, Hannover-Bothfeld, and Georg Maltz, Burgdorf, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette A.G., Hanover, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,532

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907473

Int. Cl.³ H01B 7/20, 7/28

U.S. Cl. 174—102 R **5 Claims**



1. An electrical cable comprising a core assembly including at least one insulated conductor, a hermetically closed, tubular metallic sheath concentrically positioned about said core assembly, and a filler material dispersed in and partially occupying, the spaces between the inner surface of said metallic sheath and the outer surfaces of said core assembly throughout at least a major portion of the length of said electrical cable, the improvement comprising:

(i) said metallic sheath tightly engaging said core assembly successively along at least a major portion of the length of

said core assembly, thus structurally limiting the hollow or unoccupied spaces within the electrical cable; and

(ii) said filler material being comprised of a thermoplastic admixture which absorbs at least a portion of acids and gases resulting from a decomposition of the insulation of said at least one conductor, and expands in volume upon its temperature exceeding a predetermined limit;

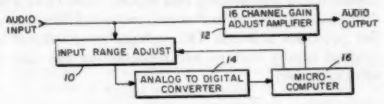
whereby, upon the continued subjection of a segment of said metallic sheath to concentrated heat, at least a portion of the acids and gases resulting from insulation decomposition is absorbed from said filler material within said heated segment, and the volume of said filler material within said heated segment expands to provide substantially complete cross-sectional occupation of any hollow spaces within said heated segment, resulting in a structural blockage to the longitudinal flow of acids and gases from within said heated segment into adjacent segments of said electrical cable.

4,297,527

INPUT GAIN ADJUSTING APPARATUS AND METHOD

Jerry W. Pate, Houston, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed May 1, 1979, Ser. No. 35,004
Int. Cl.³ H03G *3/30*
U.S. Cl. 179—1 VC **12 Claims**



1. A voice operated gain adjust apparatus for use in a voice processor that receives an analog input signal including voice signals and background noise, comprising:

means for converting the analog input signal into a digital input signal;

an amplifier having a variable gain for amplifying the analog input signal, said amplifier includes a plurality of different feedback loops and a switching circuit for connecting any of said feedback loops to the amplifier to determine the gain thereof; and

controller means including a central processing unit, a non-volatile memory for storing a program, and a volatile memory for use in executing the program, each of said memories being interconnected with said central processing unit, said controller means being responsive to the digital input signal and the stored program for detecting the presence and absence of voice signals in the analog input signal and for generating a control signal which is applied to said switching circuit for varying the gain of said amplifier according to the amplitude of the analog input signal occurring in selected time periods only when the presence of voice signals is detected.

4,297,528

TRAINING CIRCUIT FOR AUDIO SIGNAL RECOGNITION COMPUTER

Richard D. Beno, Cerritos, Calif., assignor to Interstate Electronics Corp., Anaheim, Calif.

Filed Sep. 10, 1979, Ser. No. 73,781
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SB **16 Claims**

1. Apparatus for signal pattern recognition, comprising:

means for storing a plurality of reference data patterns;

means for comparing a signal pattern with said reference data patterns for recognition; and

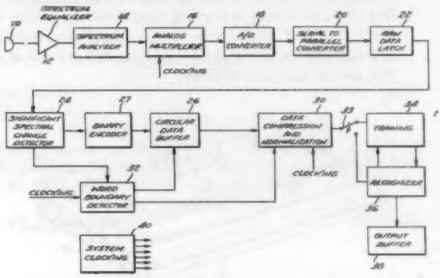
means for updating a selected one of said reference data patterns comprising:

means for inputting a training signal pattern;

means for comparing said training signal pattern with each said reference data pattern to generate a score signal for each said reference data pattern indicative of the similarities therebetween;

means for selecting the reference data pattern with the highest score for similarity with said training signal pattern;

means for combining said selected reference data pattern with said training pattern to produce a new reference data pattern; and



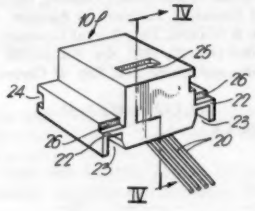
means for replacing said reference data pattern with said new reference data pattern in said storing means if said score signal is above a predetermined level without affecting any other said reference data patterns regardless of the scores of said other reference data patterns in comparison with said training signal pattern.

4,297,529

MODULAR TELEPHONE JACK

Gerald F. Webb, Thorndale, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1979, Ser. No. 89,224
Int. Cl.³ H01R *13/40, 13/62*
U.S. Cl. 179—1 PC **5 Claims**



1. A modular telephone jack having two parts, a top part and a bottom part, said parts defining an aperture therebetween for reception of a modular plug, and a plurality of cantilever spring wire contact members extending from a front end of said top part downward and rearward into said aperture, said contact members being molded at a front end integrally with said top part of the jack.

4,297,530

ELECTRONICS PACKAGE

Bayard F. Kessler, Woodland Hills, Calif., assignor to Novation, Inc., Calif.

Filed Dec. 20, 1978, Ser. No. 971,538
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 C **13 Claims**

1. A modem comprising:

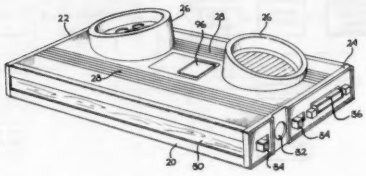
an extruded plastic central body having first and second open ends and an approximately rectangular section defining inner and outer section surfaces, said inner section surface having at least two facingly disposed slots formed

therein for receiving and supporting the side edges of at least one printed circuit board within said central body, said central body having a pair of openings on the top surface thereof,

at least one printed circuit board fitting within said two facingly disposed slots in central body,

a first and second muff, each fitting within one of said pair of openings on the top surface of said central body and being electrically coupled to said modem circuit board,

a first end cap having a portion thereof fitting within said first end of said central body for alignment therewith, said first end cap enclosing at least a substantial portion of said first end of said central body,



a second end cap having a portion thereof fitting within said second end of said central body for alignment therewith, said second end cap enclosing at least a substantial portion of said second end of said central body, at least one of said end caps having an opening for electrical connection to said printed circuit board therein, and

retaining means for retaining said first and second end caps on said first and second ends, respectively, of said central body.

4,297,531

CIRCUIT FOR SUPPRESSING NOISE INFLUENCES IN THE EVALUATION OF SIGNAL STATES ON TRANSMISSION LINES

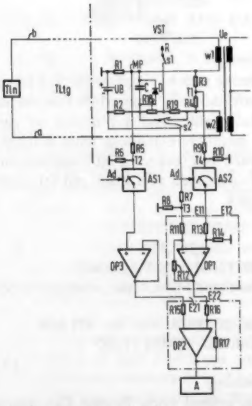
Axel Dalhof, Puchheim, and Robert Lechner, Otterfing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,250

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850929

Int. Cl.³ H04M *3/22*

U.S. Cl. 179—16 AA **4 Claims**



1. A circuit arrangement for suppressing noise voltage components which are superposed on a DC voltage signal which is to be evaluated as a status signal on a two-wire transmission line which is connectible to and supplied in symmetrical branches at feed points by a DC voltage supply in a subscriber line circuit of an exchange, comprising:

an impedance connected between a first feed point of the DC voltage supply and a connection point coupled to the two-wire line carrying a first DC voltage superposed with noise voltage components; a high-resistance shunt connected across the feed points and including a tap point;

a first differential amplifier including a first input connected to said tap point to receive a second DC voltage superposed with noise voltage components, a second input connected to a second feed point of the DC voltage supply to receive a third DC voltage which is not influenced by noise, and an output providing the noise voltage components;

first and second input means connecting said first and second inputs, respectively, to said tap and the DC voltage supply and operable to provide the third DC voltage equal to the second DC voltage;

a second differential amplifier including a first input connected to said output of said first differential amplifier for receiving the noise voltage components, a second input, and an output; and

a voltage follower circuit including an input connected to said connection point to receive the first DC voltage superposed with noise voltage components and an output connected to and feeding said second input of said second differential amplifier so that said second differential amplifier provides a fourth DC voltage proportional to the original supply voltage and representing the state of the subscriber line.

4,297,532

INTERFACING CIRCUIT STATUS DETECTION ARRANGEMENT IN A TELEPHONE EXCHANGE

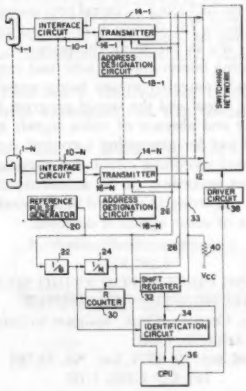
Takeo Fukuda; Kazuhiko Hanawa; Kiyoshi Urui, and Michiko Haseyama, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 20, 1979, Ser. No. 50,228

Claims priority, application Japan, Jul. 11, 1978, 53-84203

Int. Cl.³ H04M *3/22*

U.S. Cl. 179—18 AB **8 Claims**



1. A telephone exchange comprising:

a switching network;

a plurality of interface circuits each having a transmit/-receive path connected to the switching network;

a plurality of data generating circuits respectively connected to the interface circuits for detecting the states of the interface circuits and for generating state variation information when the state of at least one of these interface circuits is varied from a previous state; and

a control circuit for receiving as an interrupt signal the state variation information from the data generating circuits and for setting the switching network to a state corresponding to the state of that interface circuit whose state variation has been detected.

4,297,533

DETECTOR TO DETERMINE THE PRESENCE OF AN ELECTRICAL SIGNAL IN THE PRESENCE OF NOISE OF PREDETERMINED CHARACTERISTICS

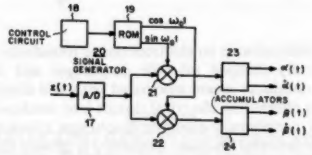
Jean-Gabriel Gander, Recherswil, and Ralph Aubert, Zug, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jun. 7, 1979, Ser. No. 46,508

Claims priority, application Switzerland, Aug. 31, 1978, 9196/78

Int. Cl.³ H04M *1/50;* **H04B** *1/06;* **H04K** *5/20*

U.S. Cl. 179—84 VF **16 Claims**



1. A detector for determining the presence of an electrical signal in the form of a tone in the presence of noise, said electrical signal having at least two predetermined characteristics, comprising in combination:

signal transforming means for obtaining a plurality of independent estimates of each of said characteristics,

classification means connected to said signal transforming means for sorting said plurality of independent estimates into at least two classes, respectively, and

counting means for signaling the presence of said electrical signal when the number of said estimates within one of said classes exceeds a predetermined number.

4,297,534

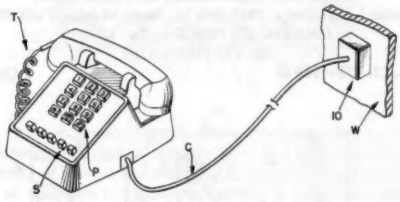
PUSHBUTTON TELEPHONE SET DISABLING MEANS

Barry M. Epstein, 7523 Cliffbrook, Dallas, Tex. 75240, and Terry M. Gernstein, 6724 Melrose Dr., McLean, Va. 22101

Filed Jan. 3, 1980, Ser. No. 109,255

Int. Cl.³ H04M *1/66*

U.S. Cl. 179—90 D **50 Claims**



1. A device for preventing unauthorized use of a pushbutton telephone set comprising:

disabling means connected to the telephone set to be electrically interposed between the telephone set and a line connecting that telephone set to a call receiving means such as a central office, PBX, key system centrex, or the like, said disabling means including frequency signal altering means which alters at least one of said intercepted frequency signals in a manner such that the call receiving means is prevented from receiving a set of frequencies in a form which is required to operate equipment at such call receiving means so that such equipment will not be operated by said at least one altered frequency signal and a call which includes said altered frequency signal will not be completed, said disabling means permitting the telephone set to receive signals incoming thereto; and

connecting means on said disabling means for selectively connecting said frequency signal altering means to the telephone set and disconnecting said frequency signal altering means from the telephone set at any time.

4,297,535

STEREO HEADSET

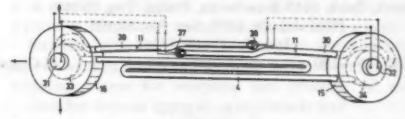
Gunter Hehemann, Kaiser-Wilheim Strasse 3B, D-8130 Starnberg, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,760

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732425; Aug. 1, 1977, 2734624; Sep. 12, 1977, 2741049; Sep. 12, 1977, 2741004; Nov. 3, 1977, 2749234

Int. Cl.³ H04R *5/00*

U.S. Cl. 179—156 R **10 Claims**



1. A stereophonic headphone comprising a pair of earpieces, each having an electro-acoustic main transducer and a sound chamber, a first sound tube coupling each of said sound chambers and a pair of auxiliary electro-acoustic sound transducers each connected electrically in parallel to the main transducer of an associated one of said earpieces, the sound chambers of each earpiece being respectively coupled acoustically to the auxiliary transducer connected to the main transducer of the other earpiece by one of a pair of second sound tubes acting to delay the transmission of said sound for a period of time which corresponds to the rectilinear propagation of the sound in a deflection section of 15 to 25 cm.

4,297,536

SELF-ADJUSTING HYBRID NETWORK

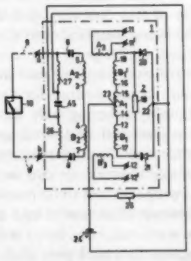
Robert B. Buchner, Bussum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1979, Ser. No. 38,377

Claims priority, application Netherlands, May 19, 1978, 7805416

Int. Cl.³ H04B *1/58*

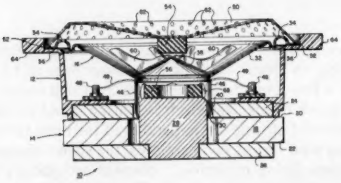
U.S. Cl. 179—170 D **6 Claims**



1. A hybrid network for connecting a two-wire subscriber's line to a four-wire line comprising:

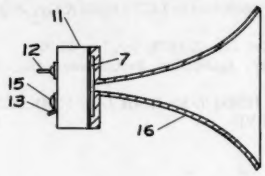
a pair of terminals connected to said hybrid network,
a d.c. supply source,
a two-wire subscriber's line connectible to said pair of terminals,
first means for coupling said subscriber line to said four-wire line,
second means for coupling said source to said terminals for supplying said subscriber line with d.c. current,
an adjustable balancing network having control inputs and an impedance whose value varies in dependence on the direct current supplied to said control inputs, and
a third means for coupling said control inputs to said terminals and said d.c. supply source such that the direct current applied to said control inputs is proportional to the direct current supplied by said source to said subscriber's line when said subscriber's line is connected to said terminals, whereby said impedance of said balancing circut is adjusted to correspond to the impedance of said subscriber's line.

4,297,537
DYNAMIC LOUDSPEAKER
Burton A. Babb, 6618 Briarhaven, Dallas, Tex. 75240
Filed Jul. 16, 1979, Ser. No. 58,105
Int. Cl.³ H04R *7/26*
U.S. Cl. 179—180 **5 Claims**



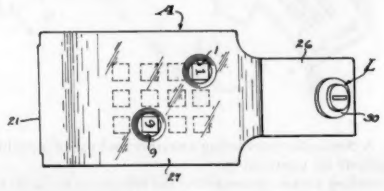
1. In a loudspeaker of the kind having a frame, a cylindrical center magnetic pole, an outer magnetic pole disposed around the center pole to form an annular flux gap therebetween, said outer pole and center pole being interconnected at their rear ends by a back pole plate, a speaker cone mounted on said frame in front of said poles for acoustically radiative reciprocation with respect thereto, said cone having an axially disposed dust cap thereon, a tubular voice coil mounted on the back of said cone and positioned in said flux gap, and an antifriction bearing member for said coil disposed in continuous sliding contact with said centerpole, the improvement comprising:
a grille positioned on said frame in front of said speaker cone;
a first bumper formed of resilient material mounted on the back of said grille, said first bumper being positioned and proportioned to lie forwardly of the largest desired forward excursion of said dust cap, said largest desired forward excursion being insufficient to displace said bearing member from said center pole, and to resiliently and quietly stop forward excursions of said dust cap which are larger than said largest desired forward excursion, said first bumper thereby affecting only those forward excursions which are greater than desired; and
a second bumper formed of resilient material mounted on the forward end of said center pole, said second bumper being positioned and proportioned to lie rearwardly of the largest desired rearward excursion of said dust cap, said largest desired rearward excursion being insufficient to impact said bearing against said back pole plate, and to resiliently and quietly stop rearward excursions of said dust cap which are larger than said largest desired rearward excursion, said second bumper thereby affecting only those rearward excursions which are greater than desired.

4,297,538
RESONANT ELECTROACOUSTIC TRANSDUCER WITH INCREASED BAND WIDTH RESPONSE
Frank Massa, Hingham, Mass., assignor to The Stoneleigh Trust, Cohasset, Mass., Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees
Filed Jul. 23, 1979, Ser. No. 59,902
Int. Cl.³ G08B *3/10;* **H04R** *1/28, 1/30*
U.S. Cl. 179—180 **11 Claims**



1. In combination in an electroacoustic transducer including a peripherally-clamped vibratile diaphragm and electromechanical transducer means associated with said diaphragm for converting alternating electrical signals into mechanical vibrations, said peripherally-clamped diaphragm characterized in that its fundamental resonant frequency is greater than 1 kHz, and further characterized in that the clamped diameter of said diaphragm is less than one-half wavelength of the sound generated at said resonant frequency, said electroacoustic transducer characterized in that the band width of the frequency response characteristic in the vicinity of resonance is relatively narrow and is equivalent to a Q factor greater than 20, means for substantially increasing the band width of the response characteristic of said transducer such that the Q factor is reduced to a value less than 8, said means for increasing the band width includes means for damping the acoustic reactance of the peripherally-clamped vibratile diaphragm over a frequency range extending at least $\pm 10\%$ beyond the resonant frequency of said transducer, said damping means characterized in that the damping is not in the form of a mechanical resistance which adds viscosity loss to the vibrating diaphragm, but that said damping is in the form of increased acoustic radiation resistance added to the vibrating diaphragm by means of an acoustic coupler interposed between the radiating surface of said vibratile diaphragm and the medium into which the acoustic energy is radiated.

4,297,539
TELEPHONE SECURITY ATTACHMENT
Thomas L. Fairbanks, 2443 34th St., Santa Monica, Calif. 90405
Filed Feb. 27, 1980, Ser. No. 125,033
Int. Cl.³ H04M *1/66*
U.S. Cl. 179—189 D **3 Claims**



1. A security attachment for restricting the use of a telephone comprised of a base and a liftable hand-set, the base having a hand-set cradle and a dial extending forwardly from the cradle to the front end of the base and comprised of a plurality of push buttons representing the digits "0" through

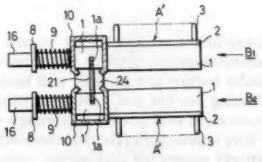
"9"; the attachment including integral planar body portions overlying the cradle and dial and front end of the base, the overlying front portion having an extension with hooked engagement beneath a bottom of the base, the body portion overlying the cradle being engageable with the cradle of the base, and the body portion overlying the dial being held in spaced relation from the dial on the base and having at least one finger aperture therethrough for access to a push button, there being lock means carried by the cradle portion of the attachment to releasably hook with the cradle of the base in opposition to said hooked engagement of the front portion.

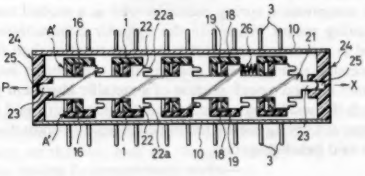
4,297,540

INTERLOCKING GANG PUSH-BUTTON SWITCH

Kotaroh Tsutsui, Furukawa, and Ryoji Kinugawa, Suita, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,388
Claims priority, application Japan, Jun. 8, 1977, 52-74611[U]
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—5 B **7 Claims**





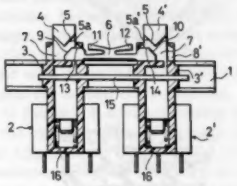
1. In a switch assembly comprising a first and a second block of identical push button switches, each said switch including a plurality of fixed terminals arranged along its length and having an operation rod movable inwardly to a latched position electrically contacting a selected one of said terminals, said blocks being arranged generally parallel in back to back relation with their fixed terminals extending oppositely, and means for releasing any switch from its latched position when any other switch is actuated to its latched position, the improvement comprising said releasing means including identical first and second cam portions formed on respective sides of the operation rods of said switches, and a common latch member having first cam parts on one side thereof for engaging said first cam portions and second cam parts on the opposing side thereof engaging said second cam portions.

4,297,541

GANGED PUSH BUTTON SWITCH HAVING MEANS PREVENTING SIMULTANEOUS ACTUATION OF TWO PUSH BUTTONS

Akira Niinuma, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1979, Ser. No. 84,533
Claims priority, application Japan, Oct. 20, 1978, 53-144226[U]
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—5 E **4 Claims**



1. A ganged push button switch assembly comprising:
a plurality of modular switches each including a push button formed with a respective cam surface, and a case formed with slots at positions adjoining said cam surface;
coupling means for coupling said plurality of modular switches into an integral switch block; and
a plate member slidably held in the slots of the respective modular switches so as to be between the two adjacent modular switches in said switch block, said plate member being formed at its ends with respective cam portions cooperating with the cam surface of said modular switches and being also formed at its central part with engaging portions having an elasticity so as to permit said plate member to be attached to and detached from said slots by deforming said engaging portions.

4,297,542

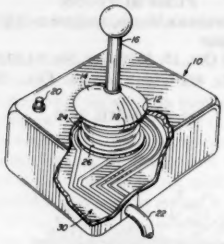
FOLDED CIRCUIT SWITCH APPARATUS HAVING MULTIPLE CONTACTS

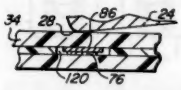
Anthony G. Shumway, 734 W. 6th Ave., Mesa, Ariz. 85202

Filed Dec. 19, 1979, Ser. No. 105,261
Int. Cl.³ H01H *19/70, 25/04*
U.S. Cl. 200—6 A **6 Claims**

1. Switch apparatus for providing a plurality of output signals, comprising, in combination:
a first flexible insulative layer;
first conductive means disposed on the first flexible insulative layer including a plurality of arcuate conductive segments disposed symmetrically on the first flexible insulative layer;
a second insulative layer;
a second conductive means disposed on the second insulative layer and including a circular conductive segment disposed adjacent the plurality of arcuate conductive segments of the first conductive means;
a third insulative layer disposed between the first and second insulative layers;
opening means in the third insulative layer to allow electrical contact selectively between one conductive segment or with two adjacent conductive segments, of the first conductive means and the circular conductive segment of the second conductive means; and

switch actuation means to provide flexing of the first flexible insulative layer to cause electrical contact between the





first and second conductive means through the opening means.

4,297,543

SAFETY DEVICE FOR CONTAINER FILLER SYSTEMS

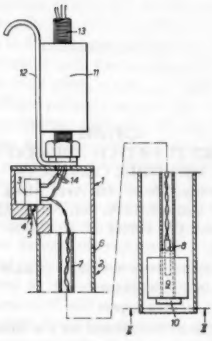
Barry Shackcloth, Harpenden, England, assignor to Total Oil Great Britain Limited, London, England

Continuation of Ser. No. 844,041, Oct. 20, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,807

Claims priority, application United Kingdom, Oct. 22, 1976, 43956/76

Int. Cl.³ H01H *35/18*

U.S. Cl. 200—18 **7 Claims**



1. The combination of a safety switch assembly and a container for use with equipment for filling said container with a liquid, the combination comprising:

a. container having a protruding peripheral wall rim defining a filler opening,

b. a switch assembly including a body portion having a first electrical switch and also having an elongated channel therein detachably receiving at least a segment of said peripheral wall rim of said container,

c. said first electrical switch having an actuator housed in said elongated body portion channel and operative to respond to the insertion of the peripheral wall rim segment of said filler opening into said elongated channel of said body portion whereby said first switch is actuated when said body portion is mounted on said filler opening peripheral wall rim to allow said liquid to enter said container, and

d. a sensing portion attached to said body portion and housing a second switch electrically connected with said first switch and operative to respond to the level of the liquid content in said container to be filled whereby said second switch is actuated and delivery of said liquid to said container is stopped when a predetermined liquid level in said container is reached.

4,297,544

PNEUMATICALLY OPERATING DELAY SWITCHES

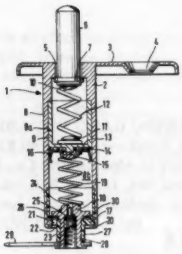
Wolfgang Priesemuth, Postkamp 13, D-2210 Itzehoe-Nordoe, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,132

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758082

Int. Cl.³ H01H *7/03*

U.S. Cl. 200—34 **5 Claims**



1. A pneumatically operating delay switch arrangement including a pneumatic piston cylinder means provided with an insulating cylinder bottom and an inner wall having an at least partially conducting portion and having a cylinder compartment in communication with outside air through a check valve and a throttle bore connected in parallel therewith and having a piston operatively connected with switch contacts comprising slide contacts as the switch contacts formed by a bracket spring rigidly connected with said piston and engaging the inner wall of the pneumatic piston-cylinder means and formed by said at least partially conducting portion of said inner wall, a first compression spring means as well as a second compression spring means located in the cylinder compartment, said second compression spring means beir.g weaker than the first compression spring means, and an outer connection including a contact lug and a neck portion of a metallic abutment passing through the insulating cylinder bottom along with said second compression spring means having electrically conductive joinder to said bracket spring.

4,297,545

SWITCHING MEANS FOR A TIMING MECHANISM

Ronald G. Darner, Bargersville, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jan. 16, 1980, Ser. No. 112,604

Int. Cl.³ H01H *7/00*

U.S. Cl. 200—38 R **5 Claims**

1. In an electrical switching means wherein cooperating electrical contacts, carried by a fixed contact blade and a pair of movable contact blades, are sequentially opened and closed through movement of said pair of movable contact blades; a means providing individual sequential movement of said pair of movable contact blades with respect to said fixed blade comprising:

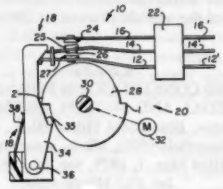
(a) a drive means,

(b) cam means actuated by said drive means and a lever

engaging said cam means and a first blade of said pair of movable contact blades,

(c) a lost motion linkage means carried by said pair of movable contact blades and linking them together,

whereby initial movement of said lever by said cam means



causes movement of said first blade and continued movement thereof due to said lost motion linkage means causes movement of both of said pair of contact blades so as to selectively engage or disengage the electrical contacts carried by the movable blades and the fixed blade from each other.

4,297,546

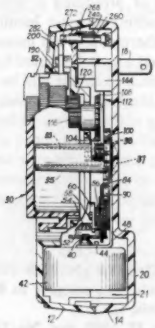
ACTUATING MEANS FOR SWITCH OPERATION IN TIMING APPARATUS

Claude V. Koch, Two Rivers, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,357

Int. Cl.³ H01H *43/10*

U.S. Cl. 200—38 R **11 Claims**



1. Timing apparatus for controlling the energization of an electrical plug receptacle into which the cord of a lamp or appliance, or the like, may be plugged, comprising

a case having front and back walls,

an electrical plug receptacle adapted to receive the prongs of an electrical plug,

electrical switch means within said case having only one movable contact blade that may be selectively moved to open and close contacts of the switch means,

said contact blade normally spring biasing said contacts to their closed positions,

means for connecting said switch means to a source of electrical power,

electrical conductor means connecting said switch means to said plug receptacle for energizing the plug receptacle when the switch means is closed and for deenergizing the plug receptacle when the switch means is open,

a time dial mounted on said case for rotation relative to said case,

an electrical motor mounted in said case,

means for energizing said motor,

gear train means coupling said motor to said time dial to rotate said time dial as a function to the rotation of said motor,

a plurality of time setting pins slidably mounted on the periphery of the time dial, each pin being slidable between an inner and an outer position, said inner and outer positions being along a path that is parallel to the axis of rotation of the time dial,

said setting pins having peripheral edges that comprise the outermost periphery of the time dial,

a switch actuator pivotally mounted for rotation about an axis that is parallel to, and fixed with respect to, the axis of rotation of said time dial,

said switch actuator having a free end that contacts said peripheral edges of the setting pins at an actuation position when the setting pins are in their inner positions but being out of contact with the peripheral edges of the pins when the setting pins are in their outer positions,

said free end of the switch actuator having such an extent relative to the circumference of the time dial with pins thereon that adjacent pins in their inner positions on the dial will continuously support said free end of the actuator as the adjacent pins pass the actuation position but a setting pin in its outer position that is between two pins in their inner positions will allow the actuator to pivot below the peripheral edges of the two inner pins and into the space therebetween,

push rod means for engaging said movable contact blade of the switch means,

said switch actuator urging said push rod means into engagement with said contact blade to move the blade to open the contacts of the switch means only when the free end of the switch actuator is in contact with the peripheral edge of a setting pin that is in its inner position.

4,297,547

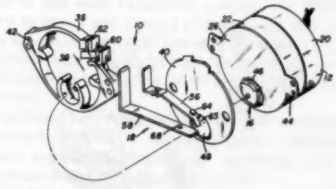
MINIATURE TIMING MECHANISM

Benjamin F. Chestnut, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 969,349, Dec. 14, 1978, abandoned. This application May 5, 1980, Ser. No. 146,616

Int. Cl.³ H01H *43/10*

U.S. Cl. 200—38 R **4 Claims**



1. A timing mechanism comprising:

(a) a motor and a gear train connected to said motor to be driven thereby,

(b) a first housing enclosing said gear train,

(c) a cup shaped second housing carried by said first housing at an open end thereof,

(d) an electrically insulative member closing said open end,

(e) a bearing surface provided in said first housing and extending through an opening in said electrically insulative member,

(f) a gear of said gear train carried within said first housing and having a unitarily constructed hub portion extending through said opening in said insulative member into said cup shaped member and at least one cam lobe unitarily constructed with said hub portion,

(g) electrical switch means carried in said cup shaped member and responsive to said cam lobe, and

(h) a circular cover carried by said cup shaped member and partially surrounding said cam lobe and in line with said opening and an outer surface of said bearing surface.

4,297,548

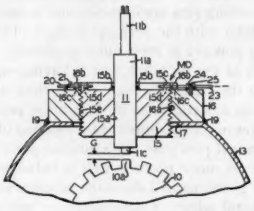
VITAL INCIDENTAL MOVEMENT MONITORING ARRANGEMENT

Donald R. Little, Greensburg, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Dec. 19, 1979, Ser. No. 105,354

Int. Cl.³ H01H *35/00*

U.S. Cl. 200—61.08 **10 Claims**



1. A vital movement monitor comprising, a support member attached to a housing of a speed measuring device, a carrier member including a sensor adjustably joined to said support member, and an electrical conductor passing through apertures formed in said support and carrier members, said electrical conductor forming part of an electrical circuit which is disrupted when incidental relative rotational movement occurs between said support and carrier members.

4,297,549

DIRECTION INDICATOR SWITCH

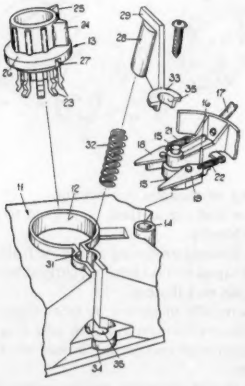
Steven J. Tregurtha, Near Accrington, and Edward Cryer, Burnley, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 7, 1979, Ser. No. 73,557

Claims priority, application United Kingdom, Sep. 12, 1978, 36233/78

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.27 **5 Claims**



1. A direction indicator switch and releasable latch means combination including a body, a member carried by the body and movable manually relative thereto from a rest position to either of first and second operative positions on opposite sides respectively of the rest position, a striker collar rotatable in use relative to said body with a steering shaft of a vehicle utilizing the switch to effect return movement of said member from either of said operative positions to said rest position, and said releasable latch means movably supported by said body whereby the striker collar is retained in a predetermined angular position relative to the body during assembly of the switch in the vehicle, said latch means being released after assembly of the switch in the vehicle to permit the collar to rotate with the steering shaft of the vehicle relative to the body.

4,297,550

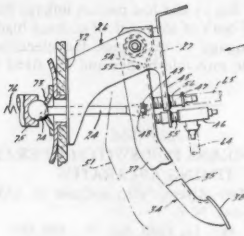
METHOD AND CONSTRUCTION FOR VEHICLE BRAKE PEDAL AND SWITCH ASSEMBLY

John D. Leighton, Bloomfield Hills, Mich., assignor to Betty Leighton, Bloomfield Hills, Mich., a part interest

Filed Mar. 1, 1979, Ser. No. 16,434

Int. Cl.³ H01H *3/14*

U.S. Cl. 200—61.89 **31 Claims**



1. In a method for assembly of an automotive brake pedal and switch, the steps of providing a pre-assembled module having a firewall mounting bracket member, a brake pedal lever member hinged thereto, resilient means urging said lever member rearwardly, and a switch carried by one of said members, adjusting said switch so that it will be actuated upon the desired movement of the brake pedal, said adjustment being made prior to mounting of the pre-assembled module upon said firewall, connecting said lever member to a brake system push rod member, mounting said module on a vehicle firewall, and connecting a lead wire to said switch, whereby forward movement of said lever member will actuate said switch.

4,297,551

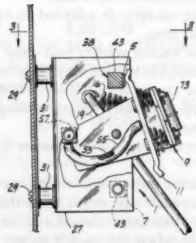
ELECTRICAL TRANSFER SWITCH

Leroy B. Ronk, Nokomis, Ill., assignor to Ronk Electrical Industries, Inc., Nokomis, Ill.

Filed Mar. 31, 1980, Ser. No. 135,266

Int. Cl.³ H01H *5/08*

U.S. Cl. 200—67 B **11 Claims**



1. A transfer switch comprising:

a support;

first and second fixed contacts mounted on the support, the first contact being connected to a terminal adapted to be

connected to line power and the second contact being connected to a terminal adapted to be connected to a generator;

a rocker pivotable between first and second positions;

a contactor carried by the rocker, connected by a flexible conductor to a terminal mounted on the support, the contactor being movable with respect to the first and second contacts and being engageable with the first contact when the rocker is in its first position and being engageable with the second contact when the rocker is in its second position, whereby said terminal on the support is adapted to be connected to line power when the rocker is in its first position and to the generator when the rocker is in its second position; and

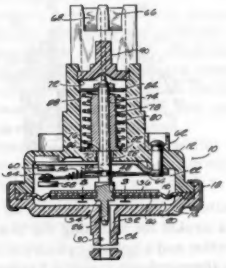
an actuator for moving the rocker between its first and second positions comprising a shaft rotatably mounted on the support and an overcentering spring, said shaft having a handle and a crank, said spring being secured at one end to the crank and at the other end to the rocker, the rocker being rotatably mounted on the shaft, the shaft being pivotable between first and second angular positions, the spring biasing the rocker to its first position when the shaft is in its first angular position and biasing the rocker to its second position when the shaft is in its second angular position, the spring applying a force to the rocker causing the rocker to snap from one of its positions to the other when the shaft is rotated from one of its angular positions to the other.

4,297,552

VACUUM SWITCH

Richard L. Lauritsen, Hoffman Estates, and Panagiotis K. Mandellos, Chicago, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Jan. 30, 1980, Ser. No. 116,860
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 P **5 Claims**



1. A vacuum switch having a housing enclosing a chamber divided by a diaphragm into a vacuum chamber and a switch chamber, a conduit leading from the vacuum chamber for connection to a variable vacuum source, a switch in the switch chamber and having a switch blade provided with a contact moveable between a normally closed and normally open fixed contacts and having a tongue which is moved to cause movement of the blade with a snap action, an actuator connected to said diaphragm and to said tongue and extending through an aperture in the housing, characterized by,

a spring retainer fixed on the outboard end of the actuator,

a reset spring bearing against and compressed between the retainer and the housing,

said actuator having a shoulder thereon in the region of the actuator passing through the housing aperture,

a tubular eyelet slidably mounted on the actuator between said shoulder and the outboard end of the actuator and having a flange engageable with the shoulder and extending beyond the aperture so as to be engageable with the outside of the housing,

a trip spring bearing against and compressed between said flange and said retainer,

said trip spring being effective to exert a force on the actuator via the retainer when said flange is in engagement with the housing and being ineffective to exert such a force when the flange is in engagement with said shoulder.

4,297,553

ENCLOSED SWITCHING APPARATUS

Yoshihiro Kawaguchi; Kosuke Higuchi, both of Yokohama, and Yoshiro Kitajima, Nagano, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 14, 1979, Ser. No. 12,012
Claims priority, application Japan, Feb. 24, 1978, 53/19879
Int. Cl.³ H01H *33/14, 33/54*
U.S. Cl. 200—145 **6 Claims**

1. An enclosed switching apparatus of the type having:

a tank including a main cylindrical portion filled with an insulating gas and provided, at a first end thereof, with a removable cover,

a circuit breaker provided in and concentrically with said main cylindrical portion of said tank and including a housing, a stationary contact provided at a first end of said circuit breaker adjacent to said first end of said tank, and a movable contact provided at a second end of said circuit breaker,

first and second contact pedestals respectively provided at said first and second ends of said circuit breaker, and

a disconnecting switch including a stationary contact and a movable contact engageable with said stationary contact,

said tank being provided with a lead-out portion extending perpendicularly to the axis of said main cylindrical portion, with the axis of said lead-out portion intersecting the axis of said main cylindrical portion, and disposed adjacent to one of said contact pedestals, and said disconnecting switch being at least partially disposed in said lead-out portion, with the axis of said disconnecting switch being substantially coincident with the axis of said lead-out portion,

said enclosed switching apparatus further comprising:

a disconnecting switch operating device mounted to said main cylindrical portion for operating said movable contact of said disconnecting switch,

a drive bar member mechanically coupling said movable contact to said operating device, said drive bar member extending through said one of said contact pedestals and crossing the axis of said main cylindrical portion of said tank, substantially along a line of extension of the axis of said disconnecting switch, and including a conductor portion electrically connected to said movable contact of said disconnecting switch,

a slide contact mounted on said one of said contact pedestals to slidably receive said conductor portion of said drive bar member,

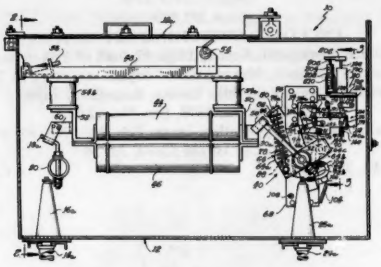
a circuit breaker operating device provided at a second end of said tank opposite to said first end, and including an insulating member movable for operating said movable contact of said circuit breaker,

said movable contact of said circuit breaker being detachable from said insulating member of said circuit breaker operating device.

4,297,554
TIME DELAY SWITCH MECHANISM

William R. Rueth, Jr., Hazel Crest, Ill., assignor to G & W Electric Specialty Company, Blue Island, Ill.

Filed Jan. 24, 1980, Ser. No. 114,742
Int. Cl.[3] H01H 7/03
U.S. Cl. 200—153 SC 16 Claims



1. In electrical switch apparatus including at least one pair of relatively movable switch contacts adapted for connection in an electrical circuit and operative between open and closed circuit conditions, switch transfer means operatively associated with at least one of said pair of contacts and operative between a first stored energy condition and a second condition enabling release of said stored energy so as to effect transfer of said switch contacts between said open and closed circuit conditions, and control means operatively associated with said switch transfer means and including a latching lever selectively operable between a latching position maintaining said switch transfer means in said first energy storing condition and a release position enabling release of said stored-energy to cause said transfer of said switch contacts between said open and closed circuit conditions; the combination therewith comprising mechanical time delay means including linkage means operatively associated with said latch lever and having at least one toggle linkage movable between an armed condition operative to maintain said latch lever in its said latching position and a release condition releasing said latch lever from its said latching position, a mechanical time delay operatively associated with said toggle linkage and directly responsive to initiation of movement of said toggle linkage from its said armed condition toward its said released condition so as to effect a predetermined time delay between initial movement of said toggle linkage and complete actuation thereof so as to release said latch lever, and actuator means for initiating movement of said toggle linkage from its said armed to its said released condition.

4,297,555
MOVABLE CONTACT ARM ASSEMBLY

Michinobu Iwai, and Akira Tanimoto, both of Mieken, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawaski, Japan

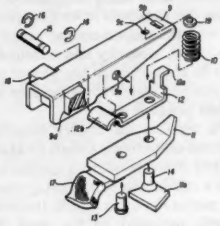
Filed May 14, 1980, Ser. No. 149,753
Claims priority, application Japan, May 14, 1979, 54-063001[U]
Int. Cl.[3] H01H 1/22
U.S. Cl. 200—153 G 6 Claims

1. An electric switching device including at least one movable contact and means for moving said movable contact between the open and closed circuit positions comprising:

a movable contact arm having a pair of spaced wall portions including aligned holes therein, one end of said movable contact arm being provided with a hole;

an elongated contact member located between said wall portions of said contact arm;

a supporting member having at least one first generally L-shaped engaging member at one end thereof and including a first portion projecting from said supporting member and a second portion angled with respect to said first portion, said second portion engaged with said hole at one end of said movable contact arm and at least one engaging member at the other end thereof, said supporting member being mounted on said elongated contact member and being positioned between said elongated contact member and said movable contact arm; and

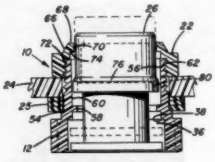


a pivot pin passing through said aligned holes in said wall portions of said movable contact arm, whereby said at least one engaging member at the other end of said supporting member is engaged with said pivot pin.

4,297,556
PUSHBUTTON OPERATOR

Glenn R. Taylor, 108 Duncan Cir., Beaver, Pa. 15009

Continuation of Ser. No. 13,664, Feb. 21, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,629
Int. Cl.[3] H01H 3/12
U.S. Cl. 200—330 2 Claims



1. A pushbutton operator for use with an electrical contact block having a stroker for actuating the block comprising:

A. a base portion and a hollow cylindrical extension made of insulating thermoplastic material having external threads on an end opposite the base portion;

B. a cap connected to a stem and disposed in the extension, the cap including an annular shoulder on its outside wall;

C. a base plate connected to the stem and located within the base portion;

D. means on the base portion for connection to the contact block; and

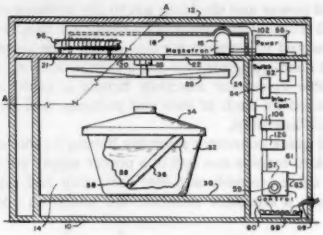
E. a clamp ring threaded to the extension to retain the cap, stem and plate in the extension and base portion of the operator, the clamp ring including an internally threaded bore having a pair of annular lips, the first lip comprising a limit for threading the clamp ring to the extension by the abutment of the first lip with the top of the extension and the second lip being of a smaller diameter than the first lip but larger than the annular shoulder on the cap to retain the cap within the extension

whereby when the operator is connected to a contact block the stroker abuts the plate to load the operator and depression of the cap moves the plate against the stroker to actuate the contact block.

4,297,557
MICROWAVE OVEN TEMPERATURE INDICATOR AND CONTROL MEANS

Hugh J. Tyler, Santa Ana, and William H. Conway, Hacienda Heights, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 3, 1976, Ser. No. 682,198
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 R **6 Claims**



1. The combination of a microwave oven and telemetric temperature probe therefor which comprises:

(a) a microwave oven housing having internal walls defining and providing microwave shielding about an oven cavity;

(b) a telemetric temperature probe including:

(b_1) microwave antenna means and power supply circuit means in circuit therewith to generate a power supply from received microwave radiation;

(b_2) temperature responsive oscillator circuit mean driven by said power supply means to generate an oscillatory signal temperature modulated frequency and of a frequency distinct from said microwave frequency;

(b_3) electromagnetic wave transmission means to broadcast said oscillatory signal; and

(b_4) a probe housing having shielding means surrounding said power supply circuit means, oscillator circuit means and wave transmission means and of selective permeability to limit transmission of microwave energy while permitting transmission of said broadcast oscillatory signal;

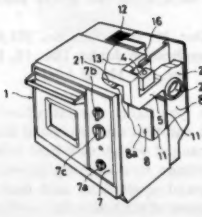
(c) signal receiver means mounted in said oven to receive said broadcast oscillatory signal; and

(d) shielding means, of selective permeability to limit transmission of microwave energy while permitting transmission of said broadcast oscillatory signal, in said oven and surrounding said signal receiver means.

4,297,558
COMPOSITE COOKING DEVICE

Minoru Inayama, Komaki, and Yukio Furukawa, Konan, both of Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 25, 1980, Ser. No. 143,873
Claims priority, application Japan, May 1, 1979, 54-57047
Int. Cl.³ H05B *6/64*
U.S. Cl. 219—10.55 R **2 Claims**



1. A composite cooking device in which the main body of a box-type cooking device is provided with a heating chamber, a heat source, a magnetron, and a cooling fan for sending air into a cooling duct having the magnetron interposed therein, further in which there is formed, between the cooking device main body and the heating chamber, a one-sided chamber with a front operation panel and an upper space which extends from the space chamber and is in communication wth the atmosphere through an exhaust opening made in the upper portion of the main body, yet further in which a control means and a high-voltage element, such as a transformer, is contained in the space chamber in which the improvement comprises:

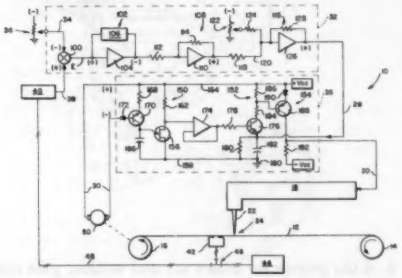
(a) said space chamber having its interior divided by at least one partition wall, such division forming (i) a front chamber adapted for containment of said control means and (ii) a rear chamber for containment of said high voltge element; and

(b) said cooling fan in communication at its intake side with the interior of said rear chamber, wherein the forward end of said cooling duct is in open communication with the exhaust opening of the main body.

4,297,559
APPARATUS FOR CONTROLLED PERFORATION OF MOVING WEBS WITH FIXED FOCUS LASER BEAM

Hobart A. Whitman, III, Asheville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed May 10, 1979, Ser. No. 37,727
Int. Cl.³ B23K *26/02*; H05B *3/60*
U.S. Cl. 219—121 LB **13 Claims**



7. A control system for a laser beam perforating apparatus, comprising:

a porosity feedback arrangement producing an error signal representative of the difference between actual web porosity as measured and desired web porosity as preset, said feedback arrangement including porosity preset means for producing a preset signal corresponding to a predetermined web porosity, porosity sensing means for producing a porosity signal corresponding to actual web porosity after perforation, and a comparator circuit connected to said preset and sensing means for producing the error signal as a function of the difference between said preset signal and said porosity signal;

velocity sensing means for producing a sensed velocity signal corresponding to actual web velocity; and

an electronic control circuit connected to said comprator circuit of said porosity feedback arrangement and to said velocity sensing means for producing a continuous pulse train responsive both to said sensed velocity signal and to said error signal and for providing a replica of said pulse train to said fixed focus laser beam perforating apparatus, the repetition rate of said pulse train varying directly in response to the sensed velocity signal and the duration of each pulse in said pulse train varying in response to the error signal, whereby a constant number of elongated perforations per unit length are produced, with the length

of the perforations dependent upon the porosity feedback error signal.

13. In a method for controllably perforating a moving web by a pulsed laser beam, the improvements comprising:

(a) focusing the pulsed laser beam at a single plane coincident with the surface of said moving web;

(b) pulsing the laser beam at a repetition rate corresponding to the lineal velocity of the moving web;

(c) pulsing the laser beam with an individual pulse duration corresponding to the difference between an actual web porosity signal and a preset signal representing desired web porosity; and

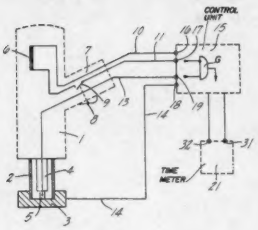
(d) thereby controllably perforating said web by a serially distributed perforation pattern having a desired ratio of perforated to non-perforated area.

4,297,560

PROCESS AND APPARATUS FOR TESTING ARC STUD WELDING GUNS

Hermann Netzsch, Grueningen, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Feb. 26, 1979, Ser. No. 14,802
Int. Cl.³ B23K 9/20
U.S. Cl. 219—130.01 **7 Claims**



1. A test process for drawn arc stud welding guns comprising the steps of:

generating an electric starting signal which activates at least one electric solenoid associated with a holding means for a clamped-in welding stud, said generating step resulting from a switching operation occurring at the beginning of a welding operation,

deriving an electric cut-out signal from the short circuiting caused by the impact of the welding stud on its counter-electrodes, and

measuring the period of time between the electric starting signal and the electric cut-out signal.

4,297,561

SEMI-AUTOMATIC WELDING GUN

Raymond L. Townsend; Jack R. Kester, and Kenneth A. Young, all of Wichita, Kans., assignors to Tweco Products, Inc., Wichita, Kans.

Filed Apr. 23, 1979, Ser. No. 32,350
Int. Cl.³ B23K 9/32
U.S. Cl. 219—137.63 **5 Claims**

1. A welding gun apparatus to supply welding wire, electrical power and shielding gas to a working area, comprising:

(a) a supply adapted assembly connected to a welding wire and gas feed unit having shielding gas, welding wire, electrical power and a control circuit;

(b) a quick connector assembly releasably connected to said supply adapter assembly to receive the shielding gas, welding wire, electrical power, and a control circuit therefrom;

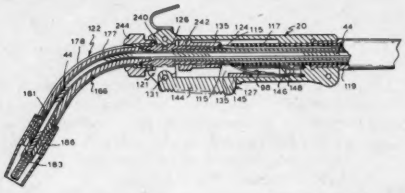
(c) a cable assembly having one end connected to said quick connector assembly to convey the shielding gas, welding wire, electrical power, and the control circuit within individual chambers;

(d) a welding gun assembly connected to the outer end of said cable assembly having control means connected to said control circuit selectively operable to semi-automatically feed the welding wire in conjunction with the electrical power and shielding gas to the working area;

(e) said welding gun assembly including a handle assembly connected to a conductor and supply tube assembly;

(f) said handle assembly having a gripper housing enclosing a cable connector assembly having a cable connector threaded on each of two end portions, and an actuator switch assembly;

(g) said quick connector assembly having a cable connector block to receive one end of a power supply conductor of said cable assembly and said conductor and supply tube therein, a separator member, and setscrews operable on



said power supply conductor and separator member to clamp said power supply conductor and said conductor and supply tube to said connector block for electrical continuity;

(h) said connector block having an elongated slot therethrough, and said separator member having upper and lower arcuate surfaces which cooperate with said setscrews and power supply conductor and said conductor and supply tube to firmly clamp said power supply conductor and said conductor supply tube therein for electrical continuity through said conductor and supply tube; and

(i) said cable connector assembly having a cable connector nut threadably engaging one of said two ends of said cable connector to secure thereto said power supply conductors of said cable assembly, said conductor and supply tube assembly including a removably, adjustable tube assembly connected to a nozzle assembly, said tube assembly having a conductor tube retaining nut engaging the other of said two ends of said cable connector in order to remove the tube assembly or to adjust the same with respect to said gun assembly.

4,297,562

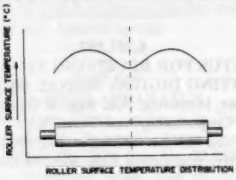
HEAT ROLLER TYPE FIXING APPARATUS

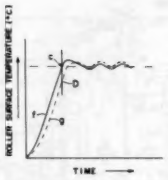
Nin-ichi Kamogawa, Tokyo, and Takashi Ito, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 101,910
Claims priority, application Japan, Dec. 15, 1978, 53-156161
Int. Cl.³ H05B 1/02
U.S. Cl. 219—216 **3 Claims**

1. In a heat roller type fixing apparatus having a heat roller with an axial center and two axial ends and accommodating a heating element arranged within said heat roller and adapted for fixing a toner image to a copying paper, a temperature sensing element spaced apart from said heat roller and for sensing the temperature of the heat roller surface and a control circuit adapted to cooperate with the temperature sensing element in controlling the heat roller surface temperature, an

improvement being that said heating element is an infrared ray heater having a temperature distribution property so arranged that the highest temperature is obtained between said axial center and both said axial ends when said heating element is energized, whereby said roller can suppress the overshoot of





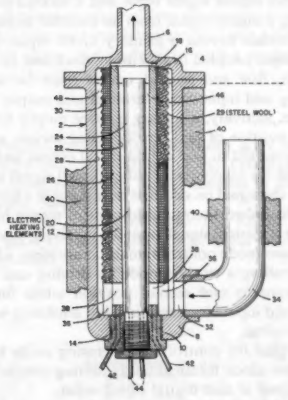
roller surface temperature, said heating element providing a predetermined, nonuniform ray density along the axial direction of said roller whereby the energy emitted by said heating element varies axially along said roller, said temperature sensing element being positioned adjacent one of said points of highest temperature.

4,297,563

ELECTRIC STEAM GENERATING UNIT

Clyde F. Berry, R.F.D. 7, Box 169 C, Manchester, N.H. 03104

Filed Mar. 26, 1980, Ser. No. 134,277
Int. Cl.[3] F22B *1/28*; H05B *3/82*
U.S. Cl. 219—275 **4 Claims**



1. A steam generating unit comprising a housing having an upper end and a lower end,

a first elongated tubular immersion type electric heating element within said housing and separated therefrom along its length to provide a cylindrical space,

said first element at its upper end being in fluid tight engagement with said housing to close the upper end of said space,

a second elongated cylindrical rod-shaped immersion type electric heating element within and coaxial with said first element,

the dimensions of said elements providing therebetween a long generally cylindrical second space of which the inner surface of said first element and the outer surface of said second element comprise the walls of said second space,

said second space being of such small volume that water therein when subjected to the heat of both elements will turn quickly to steam,

the upper end of said second space being open to allow escape of steam from said space,

a discharge port at the upper end of said housing to receive steam generated in said space, and

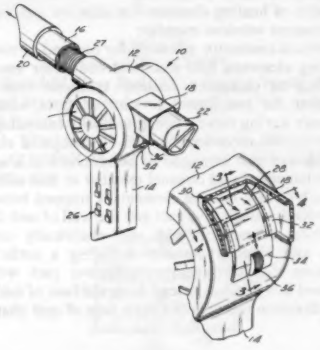
a water inlet port into said housing and a passage therefrom to the lower end of said first and second spaces whereby water can be fed to said second space as fast as the water in said second space is being converted to steam and water may be maintained in said first space.

4,297,564

HAIR DRYER

Robert R. Bartolac, 560 Calle La Roda, Camarillo, Calif. 93010

Filed Nov. 29, 1978, Ser. No. 964,721
Int. Cl.[3] A45D *20/12*
U.S. Cl. 219—367 **4 Claims**



1. In combination with a hand held, portable hair dryer, said hair dryer having a housing, a motor operated fan mounted within said housing capable of moving air, said housing including a graspable handle, said graspable handle being readily capable of being held within one hand of the operator and said housing to be easily reversibly positioned, said handle including electric switch means to operate said motor operated fan;

a first air outlet formed within said housing, an air heating element located within said first air outlet, air moved by said fan to be conducted through said first air outlet and discharged into the ambient, said first air outlet to discharge air in a first direction, the improvement comprising:

a second air outlet formed within said housing, said second air outlet also to receive air from said fan and conduct such into the ambient, the location of said second air outlet being spaced from said first air outlet, said second air outlet to discharge air in a second direction substantially opposite to said first direction, said second air outlet being void of an air heating device so as to discharge only cool air; and

means to close off said second air outlet, said means being manually movable between a closed position and an open position, said closed position not permitting conducting of air through said second air outlet and permitting the total

volume of air moved by said motor operated fan to be discharged through said first air outlet, said open position permitting conducting of air through said second air outlet resulting in the dividing of the airflow between said first air outlet and said second air outlet.

4,297,565

HEATED WINDOW STRUCTURE WITH AN ELECTRICAL CONNECTOR ASSEMBLY

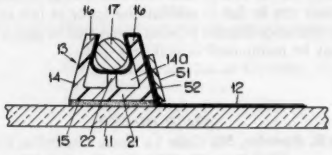
David Parr, Aberystwyth, England, assignor to David Parr & Associates Limited, GB2

Filed Oct. 3, 1979, Ser. No. 81,388

Claims priority, application United Kingdom, Oct. 5, 1978, 39524/78; Oct. 5, 1978, 39525/78

Int. Cl.³ F27B *3/06*

U.S. Cl. 219—522 **10 Claims**



1. A window heater comprising:

a plurality of heating elements for adhesive attachment to a transparent window member;

an electrical connector assembly for one end of each of said heating elements, said electrical connector assembly including an elongated resilient synthetic resin channel member for attachment to said window, said channel member having therein a longitudinally extending channel of re-entrant cross-section, and an elongated electrically conductive part arranged to be received as a snap fit in said channel of said channel member so that said one end of each of said heating elements is trapped between said electrically conductive part and the wall of said channel in electrical connection with said electrically conductive part, said channel member including a surface which supports said electrically conductive part within said channel in a position spaced from the base of said channel in a direction towards the open face of said channel.

4,297,566

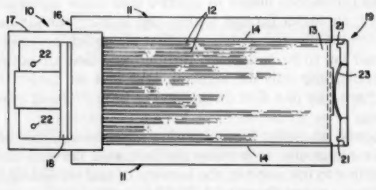
PUNCH FRAME FOR DATA REGISTERING DEVICE

John E. Ahmann, 1400 Duhig Rd., Napa, Calif. 94558

Filed Mar. 12, 1980, Ser. No. 129,585

Int. Cl.³ G07C *13/00*

U.S. Cl. 235—50 R **15 Claims**



1. In a data registering device for use with a machine-processable record punch card and including a punch card frame supporting resilient strips for receiving punched-out chad pieces pushed between the strips by a hand-held stylus, and further including a lower card guide attached at a head end of the punch card frame, an upper card guide connected to the lower card guide, said card guides being adapted to receive the punch card between them, and a stylus-guiding template slidably positioned over the resilient strips for receiving in registry the punch card immediately below, the improvement comprising removable press-fit attachment means connecting the lower card guide with the punch card frame, for permitting removal of the lower card guide from the punch card frame and replacement of the resilient strips when required.

4,297,567

APPARATUS FOR RECEIVING STORING AND OUTPUTTING DIGITAL SIGNAL SEQUENCES

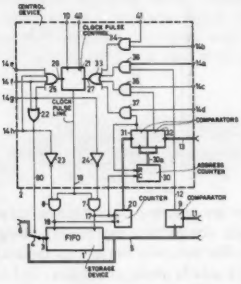
Karl H. Herzner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1979, Ser. No. 59,919

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834509

Int. Cl.³ H03K *21/34*

U.S. Cl. 235—92 PB **6 Claims**



1. Apparatus for receiving, storing and outputting digital signal sequences, said apparatus comprising:

a serial first-in-first-out storage means, having a digital signal input and an input clock terminal for storing a digital signal received under control of an input clock signal, a digital signal output and an output clock terminal for outputting and erasing a digital signal stored under control of an output clock signal, retrocoupling means having a first position for interconnecting said digital signal output to said digital signal input and a second position for receiving a digital signal from an external terminal;

a control means having a primary clock input, a primary clock output coupled to said input clock and output clock terminals, first and second inhibit lines for selectively inhibiting said input clock terminal and output clock terminal, respectively, a further control output for controlling the position of said retrocoupling means, a first data input connected to said digital signal output and a second data input for receiving a further digital signal to be compared to the signal on said first data input in a first comparing means linked thereto; said control means having furthermore a control signal input for receiving mode control signals, said mode control signals comprising: a first signal for controlling a storing mode by driving said retrocoupling means to said second position while furthermore driving said input clock terminal but inhibiting said output clock terminal;

a second signal for controlling an erasing mode by driving said output clock terminal but inhibiting presentation of a digital signal at said digital signal input;

a third signal for controlling a modifying mode regarding an individual digital signal as stored in said storage means by driving said retrocoupling means to said second position while furthermore cooperatively driving said input clock terminal and said output clock terminal; a fourth signal for controlling an outputting mode thereby outputting a sequence of digital signals as stored in said storage means by driving said retrocoupling means to said first position

while furthermore cooperatively driving said input clock terminal and said output clock terminal;

a fifth signal for controlling a first addressing mode thereby content-addressing said storage means by activating said first comparing means for generating, upon equality detected therein, a first equality signal for co-controlling a further one of said control signals.

4,297,568

COOKING APPARATUS

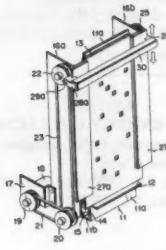
Hisahi Okatsuka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 10, 1979, Ser. No. 37,953

Claims priority, application Japan, May 16, 1978, 53-57937

Int. Cl.³ H01H *43/08;* **G06K** *7/00, 13/04, 13/06*

U.S. Cl. 235—435 **6 Claims**



1. A cooking apparatus for automatically cooking according to a program fed from a recording medium comprising:

a housing having an interior space in which food is cooked, and a front panel; and

means secured to said front panel for receiving and reading a program on a recording medium to control heating of food including a support, a pair of spaced apart rockable holding members mounted for pivotable movement between a first position holding the recording medium for reading and a second position releasing the recording medium for insertion and removal, a recording medium receiving member for receiving said medium when it is inserted between said holding members and said support and falls onto said receiving member and detecting means movable along said medium to read a cooking program from said medium.

4,297,569

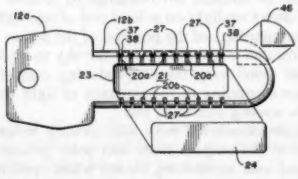
MICROELECTRONIC MEMORY KEY WITH RECEPTACLE AND SYSTEMS THEREFOR

William P. Flies, Frontenac, Minn., assignor to Datakey, Inc., Minneapolis, Minn.

Filed Jun. 28, 1979, Ser. No. 52,773

Int. Cl.³ G06K *7/06, 19/00;* **E05B** *47/06*

U.S. Cl. 235—443 **18 Claims**



1. In combination:

a key-like device having head and insert body portions, the insert body portion being adapted for insertion into a receptacle and rotation therein to a "locked" position and including in cross section

a major dimension with opposing upper and lower surfaces,

a smaller minor dimension with opposing side surfaces, and

a plurality of spaced transverse grooves formed on the major surfaces, and

An electrical circuit element encapsulated within the key, the element including a plurality of electrical leads, each of which extend into one of the grooves and lie therein to form a plurality of electrical contacts;

a receptacle defining a keyway for receiving the key insert body portion and the spaced electrical contacts carried thereby,

the keyway including a plurality of correspondingly spaced electrical contacts,

insertion guide means in the keyway for guiding the insert body portion during insertion with the contacts thereof angularly displaced from the keyway contacts,

rotation guide means in the keyway for guiding the insert body portion during rotation to a "locked" position in the receptacle and bringing the insert and keyway contacts together in contacting pairs, and wherein

each keyway contact comprises a conductive lead having a resilient bend portion positioned in the keyway for contacting a correspondingly spaced insert body contact upon rotation of the insert body to the "locked" position in the receptacle.

4,297,570

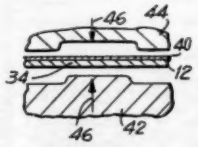
MAGNETIC STRIPE

George A. Kowalski, Deer Park, N.Y.; George Mayer, Hamden, Conn., and Murray Rosenbaum, New York, N.Y., assignors to Koller & Smith Co., Inc., Pelham, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,158

Int. Cl.³ G06K *19/02;* **G11B** *25/04;* **G06K** *19/06*

U.S. Cl. 235—493 **9 Claims**



1. A flexible sheet for use in forming a magnetic recording medium in the form of a stripe on a paper substrate, said sheet comprising a first layer of magnetic-particle-free thermoplastic material, said first thermoplastic layer being bondable to said paper substrate by application of elevated temperature and pressure to a local area thereof, a middle layer of magnetizable material permanently bonded to said first thermoplastic layer, said layer of magnetizable material consisting of a plurality of discrete magnetizable particles dispersed in a thermoplastic matrix, a second layer of magnetic-particle-free thermoplastic material, said second thermoplastic layer being permanently bonded to said middle layer of magnetizable material, said middle layer of magnetizable material being compatible with both said first and second layers of thermoplastic material, and a carrier web detachably bonded to said second layer of thermoplastic material, such that when elevated temperature and pressure is applied to a narrow rectilinear local area of said web while said first layer of thermoplastic material is disposed on said paper substrate, a magnetic stripe composed of superposed portions of said first, middle and second layers is detached in the shape of said area from said carrier web and the portions of said layers remaining on the web and transferred to said paper substrate, said second layer of thermoplastic material in said stripe forming an outer polish layer on the stripe

that reduces irregularities in the outer surface of the stripe due to the magnetic particles and minimizes abrasion of recording, erasing and reading heads, said thermoplastic matrix of the middle layer of said stripe becoming sufficiently plastic under the influence of elevated temperature and pressure during bonding to permit migration of magnetic particles towards said paper substrate during the application of elevated temperature and pressure.

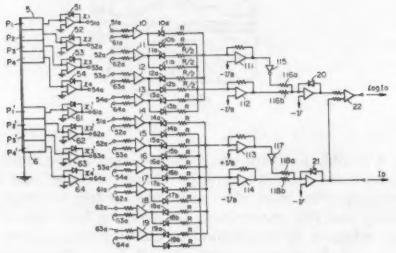
7. A document having a paper substrate and encodable with permanent, machine-readable digital data, said document having an integral permanently attached recording magnetic stripe comprising three successive layers, said three layers comprising a first layer of magnetic-particle-free thermoplastic material permanently bonded to said paper substrate by application of elevated temperature and pressure, a middle layer of magnetizable material permanently bonded to said first layer of thermoplastic material and consisting of a plurality of discrete magnetizable particles dispersed in a thermoplastic matrix, and a second layer of magnetic-particle-free thermoplastic material, said second layer of thermoplastic material being permanently bonded to said layer of magnetizable material and forming an outer polish layer on the stripe that reduces irregularities in the outer surface of the stripe due to the magnetic particles and minimizes abrasion of recording, erasing and reading heads, said thermoplastic matrix of said middle layer having become sufficiently plastic under the influence of elevated temperature and pressure during bonding so as to permit migration of magnetic particles towards said paper substrate during the application of elevated temperature and pressure.

4,297,571

FOCUS DETECTING DEVICE

Ken Utagawa, Yokohama; Kunihisa Hoshino; Hiroshi Shirasu, both of Kawasaki, and Akira Ogasawara, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,282
Claims priority, application Japan, Jan. 20, 1979, 54-5269
Int. Cl.³ G01J 1/20
U.S. Cl. 250—201 **4 Claims**



1. A focus detecting device having first and second photoelectric element arrays each including a plurality of photoelectric elements disposed so as to mutually correspond in position, and optical means for forming a first image and a second image of an object on said first and second photoelectric element arrays, respectively, so that when an objective lens is in focused position with respect to the object, the first image and the second image are positioned on said mutually corresponding photoelectric elements of said first and second photoelectric element arrays, respectively, and that when said objective lens is offset from said focused position, the first image and the second image are positioned on the photoelectric elements of said first and second photoelectric element arrays, respectively, which do not mutually correspond, in accordance with said offset, said device being for detecting the focused condition of the objective lens from the positional relations of said first image and said second image with said first and second photoelectric element arrays, respectively, the improvement comprising:

(a) first means for calculating the differences between electrical outputs related to the outputs of the mutually corresponding ones of the photoelectric elements forming said first photoelectric element array and the photoelectric elements forming said second photoelectric element array and adding together the quantities based on said differences;

(b) second means for calculating the difference between each electrical output related to the output of each of said photoelectric elements and each electrical output related to the output of the photoelectric element spaced apart from each said photoelectric element with a predetermined number of photoelectric elements interposed therebetween in the direction of arrangement of the photoelectric elements of said arrays and adding together the quantities based on said differences; and

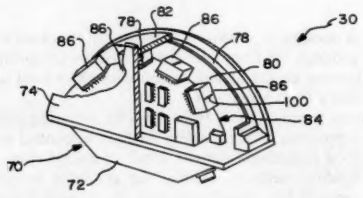
(c) third means for detecting the focused condition of the objective lens on the basis of the outputs of said first means and said second means.

4,297,572

TRACKING SOLAR ENERGY COLLECTOR ASSEMBLY

Richard J. Carlton, Sunnyvale, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Aug. 14, 1979, Ser. No. 66,402
Int. Cl.³ G01J 1/20
U.S. Cl. 250—203 R **22 Claims**



1. A tracking type of solar energy collector assembly comprising:

means including a panel member for collecting solar energy, said panel member being mounted for movement along a tracking path in order to maintain a predetermined orientation with the sun as the latter moves across the sky from an initial position immediately following sunrise to a final position immediately preceding sunset;

means for moving said panel member along said tracking path;

solar position sensing means mounted for movement with said panel member and responsive to the position of the sun for producing an output indicating whether or not said panel member is in said predetermined orientation with the sun;

direct insolation monitoring means including a plurality of fixed light sensing elements positioned in a fixed orientation with the ambient surroundings to receive a limited beam of direct sunlight on at least one of said light sensing elements regardless of the position of the sun as the latter moves from its initial position in the sky to its final position, said monitoring means producing outputs respectively corresponding to the intensity of light received at said light sensing elements; and

control means connected with said moving means and responsive to the outputs from said solar position sensing means and said monitoring means when operating in an automatic searching and tracking mode for controlling the operation of said moving means to continuously place said panel member in said predetermined orientation with the sun as the latter moves across the sky from its initial posi-

tion to its final position and so long as the intensity of light received on at least one of said sensing elements is at or above the threshold level indicative of the presence of direct sunlight.

4,297,573

POSITION TRANSDUCER FOR A ROTATING MEMBER

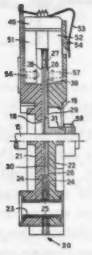
Raffaele Becchi, Ivrea; Felice Giacone, Turin, and Andrea Accattino, Salerano, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Italy

Division of Ser. No. 973,011, Dec. 26, 1978. This application May 16, 1980, Ser. No. 150,441

Claims priority, application Italy, Dec. 30, 1977, 69951 A/77

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **8 Claims**



1. An angular position transducer for a rotating member comprising a disc connected to said member, an index means carried by said disc on its periphery, and a detector responsive to the passage of said index means for detecting the angular position of said disc, and wherein the disc is fixed to said member by means of a thin, flexible lamina and is guided in a peripheral zone thereof by a guide adjacent to said detector, in such a way as to allow the recovery of misalignments and axial displacements of said rotating member by the compliance of said lamina, in order to maintain substantially constant the distance between the detector means and the periphery of the disc.

4,297,574

RADON DETECTION

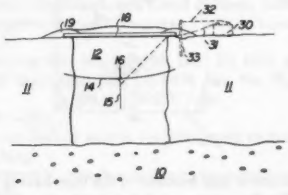
Jeffrey W. Card, 229 Argyle Ave., Apt. #308, Ottawa, Ontario, Canada (K2P 1B8), and Keith Bell, 295 5th Ave., Ottawa, Ontario, Canada (K1S 2NP)

Filed Apr. 26, 1979, Ser. No. 33,497

Claims priority, application Canada, Feb. 26, 1979, 322299

Int. Cl.³ G01V *5/00;* **G01T** *1/04*

U.S. Cl. 250—253 **19 Claims**



1. A method of exploring for uranium by detecting decay products of radon as an indication of the presence of uranium mineralization, comprising the steps of:

providing, at respective spaced-apart locations at a uranium exploration site, a plurality of decay product collectors having at least substantially similar surface areas;

enclosing each of said collectors at its respective location in an air space in which said collectors are exposed to radon migrating from the ground;

the enclosure of the air spaces maintaining the air within the air spaces in a substantially undisturbed condition during the exposure of said collectors;

continuing the exposure of said collectors for a period of time sufficient for the radon to migrate by natural processes into the air spaces and for the decay products of the migrating radon to become deposited on said collectors;

terminating the exposure of said collectors;

measuring alpha particles, beta particles or gamma rays emitted by decay of the decay products deposited on said collectors;

the measurements of the alpha particles, beta particles or gamma rays being initiated at at least substantially equal respective time intervals following the terminations of the exposures of said collectors and being effected over at least substantially equal measurement periods; and

comparing the measurements thus obtained from the spaced-apart locations to provide an indication of the presence or absence of uranium mineralization at, or geologically associated with, the uranium exploration site.

4,297,575

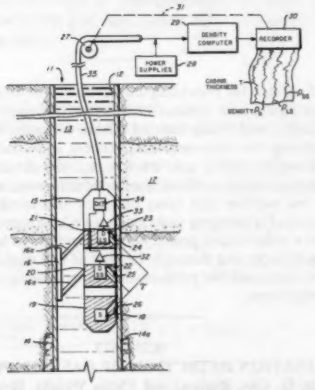
SIMULTANEOUS GAMMA RAY MEASUREMENT OF FORMATION BULK DENSITY AND CASING THICKNESS

Harry D. Smith, Jr.; Dan M. Arnold, both of Houston, and Kenneth J. Smith, Rosenberg, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 13, 1979, Ser. No. 66,125

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—265 **15 Claims**



1. A method for logging a cased well borehole to determine simultaneously the bulk density of earth formations behind the wall casing and the thickness of the well casing, comprising the steps of:

emitting low energy gamma radiation from a source of such radiation in a well borehole into the casing and earth formations surrounding a cased well borehole;

detecting at a first, longitudinally spaced distance from said source, gamma radiation scattered back into the borehole by the casing and earth formations and generating first count rate signals representative thereof;

detecting at a second, differently longitudinally spaced distance from said source, gamma radiation scattered back into the borehole by the casing and earth formations and generating secound count rate signals representative thereof;

combining said first and second count rate signals according to a predetermined relationship to derive a third signal

representative of the earth formation bulk density compensated for detector standoff from the earth formation caused by the casing and a fourth correction signal representing the correction required to compensate said third signal for the standoff;

combining said third and fourth signals according to a second, different predetermined relationship, to derive a fifth signal representative of the thickness of the casing in the vicinity of said detectors; and

recording at least said third and fifth signals.

4,297,576

DEVICE FOR THE INTERCONNECTION OF CONDUCTIVE TERMINALS LOCATED WITHIN A DEMOUNTABLE ENCLOSURE AND CONDUCTIVE TERMINALS LOCATED OUTSIDE SAID ENCLOSURE

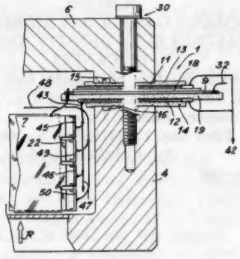
Michel Laval, Saint Martin D'Uriage, and Edmond Tournier, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 23, 1979, Ser. No. 97,051

Claims priority, application France, Nov. 28, 1978, 78 33545

Int. Cl.³ G01T *1/18;* G01N *21/00*

U.S. Cl. 250—336 **6 Claims**



1. A device for providing interconnection between conductive terminals, said terminals having variable potentials appearing thereat and being located within a conductive enclosure comprising two demountable portions, and conductive terminals located outside said enclosure, said device comprising conductive layers, a plurality of conductors mutually insulated from one another and lying between said conductive layers, and means for bringing said conductive layers and said conductors to a polarization potential, said conductive layers and said conductors passing through the wall of said enclosure between the two demountable portions thereof and being insulated from said enclosure.

4,297,577

RADIATION DETECTION OF GAS COMPOSITIONS

Charles D. Coe, Barlow, and Philip Wright, Dronfield Woodhouse, both of England, assignors to Land Pyrometers Limited, Sheffield, England

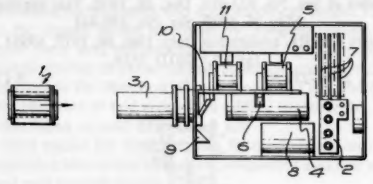
Filed Nov. 29, 1979, Ser. No. 99,008

Claims priority, application United Kingdom, Nov. 29, 1978, 846533/78

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—343 **1 Claim**

1. Equipment for the monitoring of gas in-situ comprising an infra-red source adapted to propagate a radiation beam through ducting or the like through which the gas to be analysed passes, a detector spaced from the infra red source responsive to radiation from the beam, a band-pass filter in the beam path to restrict beam radiation incident on the detector to a predetermined wavelength range, and a filter cell adapted to be positioned in the radiation path between the detector and the source, said cell being filled with the gas component requiring analysis, the detector and source being arranged such that the detector is responsive to beam radiation that passes in the ducting only through the gas to be analysed and to beam radiation that passes through the gas to be analysed and the cell, the detector being connected in a circuit including first means for measuring radiation passing through a first radiation path, second means for measuring radiation passing through a second radiation path, said gas to be analysed being in said first and second radiation paths, said gas component filter cell being in only said second radiation path, third means responsive to said first means and second means respectively for obtaining



two levels of radiation, fourth means for determining a difference between the two levels of radiation, a fifth means for dividing the difference by either of the two levels of radiation received by the detector, an output of said circuit being a function of the amount of monitored gas present in the gas flow, including calibration means comprising a second infra red source generating radiation along a sight path, said sight path including an enclosure containing a fixed concentration of gas or no gas, said detector being selectively exposed in said sight path for equipment calibration.

4,297,578

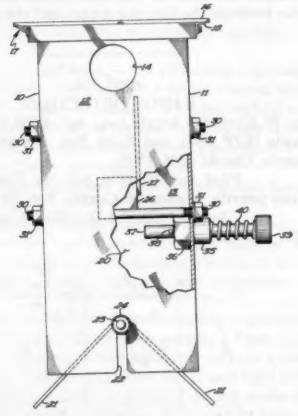
AIRBORNE DUST MONITOR

William R. Carter, 5021 Wooddale La., Minneapolis, Minn. 55424

Filed Jan. 9, 1980, Ser. No. 110,601

Int. Cl.³ G01J *1/00;* G01N *21/00*

U.S. Cl. 250—343 **7 Claims**

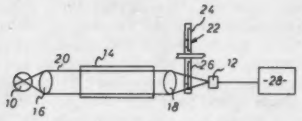


1. In an airborne dust monitor of the type having photosensitive means for detecting a predetermined airborne dust level at a test region, the improvement which comprises generally vertical flue means for establishing a flow of ambient air through said test region, said detecting means being housed within said flue means adjacent said test region, and test means, including test element means, operable from the outside of said flue means for selectively positioning said test element means within said test region.

4,297,579
BI-FREQUENCY INFRARED SPECTROMETER

Tilman P. Spaeth, Sipplingen, Fed. Rep. of Germany, assignor to Bodenseewerk Geosystem GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,505
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924131; Jun. 15, 1979, 2924132; European Pat. Off., Jun. 15, 1979, 79101976
Int. Cl.³ G01N *21/26*
U.S. Cl. 250—343 **13 Claims**



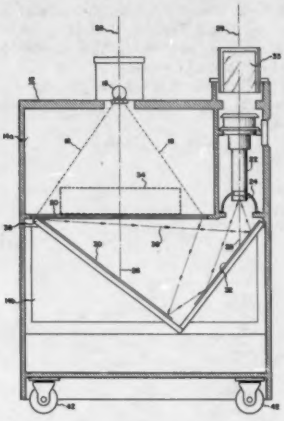
1. Signal processing circuit for the separation of overlapping signals, which are provided by a detector subjected to alternating measuring quantities and having inertia and/or memory,
wherein the detector signal is integrated by an integrator during predetermined reference and measuring time intervals, each of which is associated with one of the alternating measuring quantities,
characterized in that
(a) a clamp circuit acting on the detector signal and controlled by a programmer is provided,
(b) the output signal of the clamp circuit is applied to the integrator directly through a first switch controlled by the programmer, and inverted through a second switch also controlled by the programmer,
(c) one switch is closed by the programmer during each reference and measuring time interval and the other switch is closed during compensation time intervals defined before each reference and measuring time interval,
(d) the clamp circuit is arranged to be actuated by the programmer to clamp the detector signal to a baseline before each reference, measuring and compensation time interval,
(e) the programmer is arranged to apply the output signal of the integrator or a function of this signal to one memory circuit each, after each reference time interval and after each measuring time interval, and
(f) furthermore the integrator is arranged to be reset to zero by the programmer after each application of the output signal to one of the memory circuits.

4,297,580
X-RAY OPTICAL SYSTEM FOR ARTICLE INSPECTION, WITH COMPONENTS DISPOSED ON PARALLEL AXES

Adolph Juner, City Island, and David J. Haas, Suffern, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 864,503, Dec. 27, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,467
Int. Cl.³ G01T *1/00*
U.S. Cl. 250—368 **20 Claims**

1. An X-ray optical system for examining an inanimate article, comprising:
(a) a source of X-rays directed in a generally downward first direction,
(b) a flourescent screen means for converting said X-rays to a light image, said screen means being disposed below said X-ray source,
(c) means for receiving said article between said X-ray source and said fluorescent screen means such that said X-rays passing through said article reach said screen means to generate thereat a light image of said article,
(d) a first light reflecting means disposed below said flourescent screen means for receiving said light image from said fluorescent screen means, said light image being directed in said first direction,
(e) second light reflecting means disposed opposite and obliquely to said first light reflecting means for receiving said light image reflected from said first light reflecting

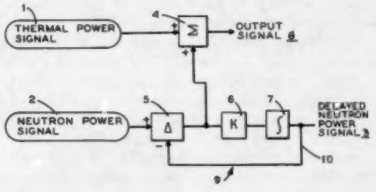


means and for redirecting said light image in a upward second direction, and
(f) means for viewing said redirected light image, said viewing means being disposed above said second light reflecting means, said viewing means including an image intensifier for receiving said light image from said second light reflecting means.

4,297,581
METHOD FOR THE FAST AND ACCURATE IDENTIFICATION OF CORE POWER IN NUCLEAR REACTORS

William T. Brunson, and Anthony F. Lexa, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 15, 1979, Ser. No. 3,444
Int. Cl.³ G01T *3/00*
U.S. Cl. 250—391 **4 Claims**



1. A method for accurately and rapidly generating an output signal corresponding to the power of a nuclear reactor having a reactor core and a heat receiving fluid passing through said core in heat transfer relationship therewith which comprises: generating a first neutron flux signal corresponding to reactor power at a first point in time; generating a second neutron flux signal corresponding to reactor power at a subsequent point in time; generating a thermal power signal, at the subsequent point in time, derived from a thermal differential of the fluid cooling the reactor; generating an output signal, at the subsequent point in time, by varying the thermal power signal in

proportion with a predetermined relationship of the first and second neutron flux signals.

4,297,582

RADIATION DIAGNOSTIC DEVICE FOR GENERATING TOMOGRAPHIC IMAGES

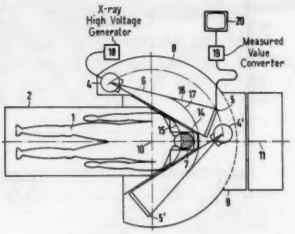
Günter Schwierz; Rudolf Schittenhelm; Günter Schmitt, all of Erlangen, and Edgar Tschunt, Rathsberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,464

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834934

Int. Cl.[3] **G03B** *41/16*

U.S. Cl. 250—445 T **2 Claims**



1. A diagnostic device for generating layer images of an exposure subject, said device comprising

(a) a patient support (**2**) providing a generally horizontal patient support surface at which a patient is supported so as to position a body layer to be examined in a longitudinally disposed scan plane generally parallel to the plane of said patient support surface and at a predetermined distance above the patient support surface less than the patient thickness,

(b) a measuring arrangement for the irradiation of the body layer to be examined by means of x-rays to produce a series of scan projections with respective directional axes lying in said scan plane and each projection providing a multiplicity of beam paths in said scan plane and intersecting the body layer in a generally fan shaped beam configuration, said measuring arrangement including an x-ray radiation soruce (**4**) which emits x-ray radiation for providing said fan beam configuration in said scan plane with lateral extent corresponding to the extent of said body layer in said scan plane,

(c) said measuring arrangement further including a radiation receiver (**5**) disposed in the plane of said fan shaped beam configuration and arranged to intercept the fan shaped beam configuration on the opposite side of the body layer from the radiation source during irradiation of the body layer for each scan projection in said scan plane, and to supply output signals corresponding to the measured radiation intensity for respective beam paths of the fan shaped beam configuration for each scan projection of the body layer,

(d) a measured value converter (**19**) connected with the radiation receiver for calculating attenuation values for specific image points of the irradiated body layer from the output signals of the radiation receiver,

(e) scanning means (**8**, **10***a*) coupled with said measuring arrangement and providing for movement thereof in said scan plane so as to irradiate said body layer along the respective directional axes in accordance with said series of scan projections during a scanning operation, and so that the body layer to be examined is scanned by being penetrated exclusively along beam paths of the fan shaped bean configuration each of which is crossed, along its entire length in the body layer, by a multitiude of other beam paths,

(f) mounting means (**9**, **12**) mounting said scanning means (**8**, **10***a*) such that the measuring arrangement moves along a path lying in the scan plane and such that the fan shaped beam configuration sweeps through an acruate region lying in the scan plane and extending from one side of the patient support to the other over an angular extent of substantially less than 360° to avoid irradiating a patient lying on the patient support except at the body layer, and

(f) means comprising said scanning means and said mounting means for sweeping the fan beam configuration during a scanning operation in a scan plane lying a distance above the patient support surface less than the patient thickness such that a 360° movement of the measuring arrangement about the body layer, which is prevented by a patient on the patient support, is unnecessary to the production of a layer image of said body layer, said last-mentioned means directing the beam configuration obliquely relative to a radial line from the x-ray radiation source (**4**) to the center of curvature (**10**) of the arcuate region swept by the beam configuration such that the arcuate region swept by the beam configuration durng the scanning operation is essentially clear of the patient except at the body layer.

4,297,583

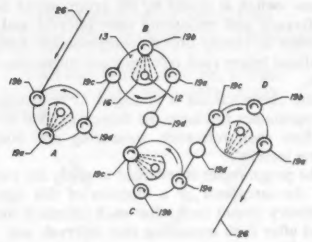
ULTRAVIOLET LIGHT APPARATUS

Irving Nerod, Spotswood, N.J., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 11,525, Feb. 8, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,373

Int. Cl.[3] **H01J** *37/00;* **F26B** *3/30*

U.S. Cl. 250—453 **4 Claims**



1. Apparatus for curing ink or coatings on a cylindrical container comprising:

(a) a frame;

(b) a wheel, mounted on said frame for rotation about an axis;

(c) a reflector, affixed to said wheel for movement therewith about said axis, said axis being co-incident with a first focus of said reflector and wherein a second focus is outward thereof;

(d) a radiant energy source fixedly mounted on said frame, substantially co-extensive with said reflector and disposed at said first reflector focus;

(e) a belt disposed to engage said wheel at the circumference and drive said wheel, said belt including a plurality of carriers mounted thereon for (one of said carriers) supporting and (maintaining said container in confronting alignment with said reflector) conveying said containers, said carriers being disposed along said belt at intervals equal to the circumference of said wheel, said belt engaging said wheel to advance said carriers into individual registration with said reflector wherein said container mounted on said registered carrier is substantially coextensive with said energy source and is confrontingly aligned with said reflector whereby said confrontingly aligned container intercepts rays from said reflector, prox-

imate the second focus of said reflector, and wherein said rays are maintained substantially in focus on said confrontingly aligned containers as said confrontingly aligned container moves around said energy source; and

(f) means for rotating said carriers as said carriers move around said energy source thereby ensuring uniform irradiation of said confrontingly aligned container by said focused rays of energy.

4,297,584

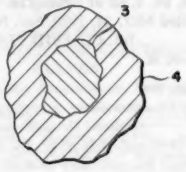
RARE EARTH PHOSPHORS AND PHOSPHOR SCREENS

Robert A. Buchanan, Palo Alto; T. Grant Maple, and Alden F. Sklensky, both of Sunnyvale, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Apr. 11, 1977, Ser. No. 786,227

Int. Cl.³ G01J *1/58*

U.S. Cl. 250—483 **33 Claims**



1. A stabilized rare earth oxybromide phosphor consisting essentially of at least one oxybromide selected from the group consisting of yttrium oxybromide, lanthanum oxybromide and gadolinium oxybromide in which from about 0.001 percent to about 10 percent of the host metal ions have been replaced by trivalent cerium ions and characterized by having an integral, continuous surface layer of at least one rare earth oxychloride selected from the group consisting of yttrium oxychloride, lanthanum oxychloride and gadolinium oxychloride in which from about 0.001 percent to about 10 percent of the host metal ions have been replaced by trivalent cerium ions.

4,297,585

SYSTEM FOR THE DETECTION OF SPLICING DEFECTS IN FILM

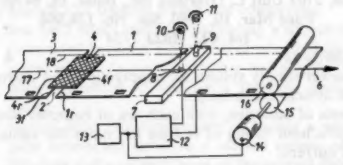
Werner Puschmann, Langenfeld, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 27, 1979, Ser. No. 107,652

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856705

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—560 **16 Claims**



1. A system for identifying a defective splice which improperly bridges a gap located between a leading strip of film and a trailing strip of film, and for identifying an improper gap, when the strips are moving at a constant rate past a fixed line segment located on and oriented transversely to a path along which the strips travel, the path dividing an imaginary line which intersects the line segment and is oriented normally with respect to the path into a first side and a second side, comprising:

a gap sensor producing a time-varying gap signal with a gap stage and a strip state, the gap signal assuming the strip state whenever a strip is located at the line segment and assuming the gap state whenever a gap is located at the line segment;

a splice sensor producing a time-varying splice signal with a splice state and a non-splice state, the splice signal assuming that splice state whenever a splice is located at the line segment and assuming the non-splice state otherwise; and

a congruance computer responsive to the gap signal and splice signal and producing an output signal with a congruance state and a discongruance state, the output signal assuming the congruance state when and only when the splice is properly bridging the gap and the gap is proper, and assuming the discongruance state otherwise.

4,297,586

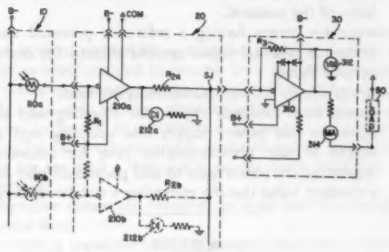
PHOTO-ELECTRIC DIGITAL CIRCUIT FOR MONITORING STRIP LOOP POSITION

John M. Rodgers, 12990 Club Dr., Redlands, Calif. 92373

Filed Feb. 25, 1980, Ser. No. 124,628

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—561 **5 Claims**



1. Apparatus for monitoring strip loop position in a strip loop reservoir comprising:

a plurality of light sources and a corresponding plurality of photo-detectors spaced from each other on opposite sides of the strip loop path in the strip loop reservoir;

a plurality of first amplifying means, each said first amplifying means having its input coupled to a corresponding photo-detector, said first amplifying means being normally biased to be driven substantially to positive or negative saturation as a function of the input voltage applied to said first amplifying means through said corresponding photo-detector, the outputs of said plurality of first amplifying means being coupled together at a summing junction;

second amplifying means having its input coupled to the summing junction for amplifying the voltage and current signals appearing at said summing junction; and

means coupled to the output of said second amplifying means for remotely visually monitoring the strip loop position as a function of the output of said second amplifying means.

4,297,587

ABSOLUTE DC SYSTEM FOR A LASER INSPECTION SYSTEM

Cole H. Baker, Westport, Conn., assignor to Intec Corporation, Trumbull, Conn.

Filed Mar. 7, 1980, Ser. No. 128,286

Int. Cl.³ G01N *21/30*

U.S. Cl. 250—563 **7 Claims**

1. A stabilized absolute direct current system for controlling the sensitivity of a light inspection system having a laser generating a laser beam and a scanner for scanning said laser beam

over a surface of a moving material being inspected thereby to detect flaws in said material comprising:

a receiver for collecting laser beam radiation emanating from said material,

said receiver having a photomultiplier tube for detecting and generating signals in accordance with the intensity of radiation applied thereto,

means for applying a sample of radiation from said laser beam to said photomultiplier tube for generating a reference pedestal signal dependent on the intensity of said laser beam which is free of the influence of the characteristics of the material,

comparator means having a reference potential and said reference pedestal signal applied thereto for deriving a control signal,

a power supply for said photomultiplier tube,

a closed loop feedback circuit for coupling said control signal to said power supply and coupling said power supply to said photomultiplier tube for automatically regulating the power gain to said photomultiplier tube to a constant value thereby providing a stabilized dc system.

4,297,588

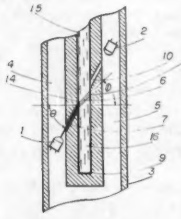
ELECTRO-OPTICAL LEVEL

Albin A. Hastbacka, 3 Singlefoot Rd., Chelmsford, Mass. 01824

Filed Feb. 6, 1979, Ser. No. 9,853

Int. Cl.³ G01N *15/06*

U.S. Cl. 250—577 **3 Claims**



1. A level indicating device comprising:

a device with two legs joined at one end wherein said legs are spaced to form a slot within which a solid or liquid in a container is capable of being placed;

a collimated light source within one leg of said device which is directed to fall upon a light sensor in the second leg of said device in the absence of a solid or liquid in a container within said slot wherein the collimated light beam from said light source is positioned to strike a transparent solid or transparent liquid in a transparent container, inserted into said slot of said device, at an angle which is substantially off of a line perpendicular to the surface of said inserted solid or liquid container so that the refracted light beam passing through said transparent solid or liquid container will not fall upon said light sensor in the presence of said transparent solid or transparent liquid in transparent container;

a pair of rectangular slots or cylindrical tunnels which aperture limit the light beam emanating from said light source and the received light beam falling upon said light sensor;

means for exciting said light source;

means for detecting the presence or absence of said light beam falling upon said light sensor so as to provide a visible or audible indication of the presence or absence of said solid or liquid between said light source and light sensor.

4,297,589

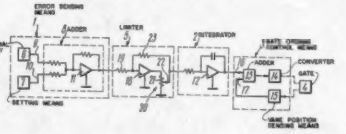
SPEED GOVERNOR FOR A HYDROELECTRIC UNIT

Oleg I. Bashnin, prospekt Maiorova, 53, kv. 13; Vasily V. Semenov, Moskovsky prospekt, 171, kv. 92; Vasily N. Fedorov, Prazhskaya ulitsa, 23, kv. 61; Nikolai M. Gorbunov, ulitsa Brjusovskaya, 6, kv. 100; Evgeny I. Rodionov, prospekt Raevskogo, 8, kv. 21, and Nikolai A. Sorokin, Sredneokhtinsky prospekt, 46, kv. 4, all of Leningrad, U.S.S.R.

Filed Mar. 14, 1980, Ser. No. 130,267

Int. Cl.³ F01D *17/02*

U.S. Cl. 290—40 R **2 Claims**



1. A speed governor, for a hydroelectric unit including a hydraulic turbine having a gate apparatus for controlling the flow of water to the hydraulic turbine runner, comprising:

an error sensing means having a signal generated at an output which is representative of a deviation of the hydroelectric unit rotational frequency from an assigned value;

an integrator having an input and an output;

a gate opening control means connected to said output of said integrator and adjusting the degree of opening of said gate apparatus in accordance with the value of the integrator output signal; and

a limiter having an input and an output, said input of said limiter being connected to said output of said error sending means, and said output of said limiter being connected to said input of said integrator, said limiter limiting the maximum value of the signal applied to said input of said integrator to a limit value equal to the minimum integrator input signal value which insures a maximum permissible rate of change of the degree of opening of said gate apparatus.

4,297,590

POWER SUPPLY SYSTEM

Ande Vail, 3702 Unit C, Overland Rd., Boise, Id. 84705

Filed Mar. 10, 1980, Ser. No. 128,566

Int. Cl.³ H02J *7/34*

U.S. Cl. 307—43 **4 Claims**

1. A power supply system for supplying direct current to a load, said system comprising:

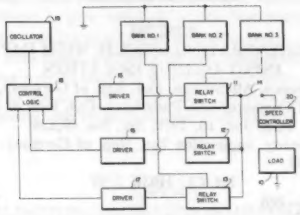
three sets of batteries, with each set of batteries having an ampere/hour rating of at least ten times the value of the load current;

circuitry connecting each of the three sets of batteries to the load;

three sets of switching means for opening and closing the respective circuits between the load and each set of batteries; and

control means for alternating each set of switches in open and closed position, wherein the closed position has a time duration about twice that of the open position, and the switches are switched open and closed in cyclic, predeter-

mined order with the first switch closing at about the same time the second switch opens, the second switch closing



about the same time the third switch opens, the third switch closing about the same time the first switch opens, and then repeating the cycle.

4,297,591

ELECTRONIC COUNTER FOR ELECTRICAL DIGITAL PULSES

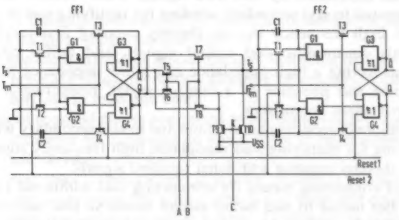
Helmut Roesler, and Otto Muehlbauer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,675

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833211

Int. Cl.³ H03K *23/08, 21/30, 21/06*

U.S. Cl. 307—224 C **9 Claims**



1. In a counter of the type in which a plurality of flip-flops each having a pair of inputs and a pair of outputs are provided in a chain connection and a plurality of transfer circuits are respectively interposed between successive flip-flops, the improvement wherein each of said transfer circuits comprises:

a plurality of transfer transistors having conduction paths connected between the outputs of one flip-flop and the inputs of the subsequently connected flip-flop and control electrodes for receiving control signals to determine the direction of counting,

said plurality of transfer transistors comprising

a first field effect transistor including a source-drain path connected between a first output of a first flip-flop and a first input of a next successive, second flip-flop, and a gate connected to receive a forward count control signal;

a second field effect transistor including a source-drain path connected between a second output of the first flip-flop and a second input of the second flip-flop, and a gate connected to receive the forward count control signal;

a third field effect transistor including a source-drain path connected between said second output and said first input, and a gate connected to receive a backward count control signal; and

a fourth field effect transistor including a source-drain path connected between said first output and said second input, and a gate connected to receive the backward count control signal.

4,297,592

INTEGRATABLE DYNAMIC CURRENT SOURCE FOR SEMICONDUCTOR MODULES

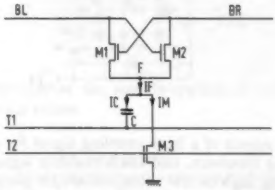
Karlheinz Url, Munich, and Paul W. von Basse, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,867

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2839073

Int. Cl.³ H03K *5/00, 5/22*

U.S. Cl. 307—583 **3 Claims**



1. A current source for a read-out amplifier having two transistors cross-coupled to two bit lines of a MOS memory, said transistors having respective source electrodes connected together at a node which is charged before the beginning of a read-out cycle and is successively discharged in a selected manner for the evaluation of a read-out signal, said current source for use with a first and a second clock pulse line and comprising:

a capacitor connected between the node and the first clock pulse line;

a switching transistor having a control electrode connected to the second clock pulse line and having a first terminal connected to said node and a second terminal connected to a reference potential;

said first clock pulse line providing a voltage signal during each read-out cycle which changes from a high voltage level to a reference voltage level;

said second clock pulse line providing a voltage signal during each read-out cycle changing from a reference potential level to a high potential level;

said capacitor and said switching transistor operating in combination to provide a voltage signal at said node during each read-out cycle, said signal changing from a high potential to a reference potential through a transition portion of said signal, said transistion portion having an initial region of slow transition having a low slope followed by a region of rapid transition having a high slope.

4,297,593

GLITCH ELIMINATOR CIRCUIT FOR TTL TRANSPARENT LATCH

Gordon H. Allen, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1980, Ser. No. 128,773

Int. Cl.³ H03K *17/56*

U.S. Cl. 307—247 R **11 Claims**

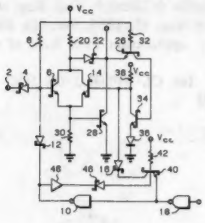
1. A latch circuit capable of operating in a transparent mode or a latching mode and having an input terminal for receiving an input data signal which may assume high or low voltage levels and having an output terminal, comprising:

an input transistor having base, emitter and collector terminals, said base terminal coupled to said input terminal;

a latching transistor having base, emitter and collector terminals, the emitter and collector terminals of said latching transistor being coupled to the emitter and collector ter-

minals respectively of said input transistor, the collector terminals of both said input and said latching transistors being coupled to said output terminal;

a first source of a latch disabling signal coupled to the base of said input transistor, said latch disabling signal capable of assuming high or low voltage levels for placing said latch circuit in the transparent mode when said latch disabling signal is high;



a second source of a latch enabling signal for enabling said latching transistor, said latch enabling signal capable of assuming high or low voltage levels for placing said latch circuit in the latching mode when said latch enabling signal is high, said latch enabling signal occurring prior to said latch disabling signal; and

means for synchronizing said latch disabling signal with said latch enabling signal so as to turn said input transistor on substantially simultaneously with turning said latching transistor off when said input data signal is high.

4,297,594

GATE CIRCUIT FOR A GATE TURN-OFF THYRISTOR

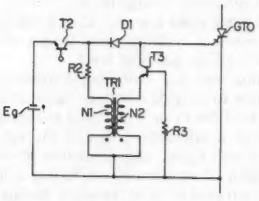
Kenichi Onda, Hitachi; Sadaji Tashiro, Kumagaya, and Hisao Amano, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

Filed Jun. 21, 1979, Ser. No. 50,522

Claims priority, application Japan, Sep. 27, 1978, 53-119015

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 C **4 Claims**



1. A gate circuit for a gate turn-off thyristor having a cathode, an anode, and a gate, comprising:

a series connection of a d.c. power supply source and a first switching element, said series connection being inserted between the cathode and the gate of said gate turn-off thyristor through a diode, the positive pole of said d.c. power supply source being connected to the cathode of said gate turn-off thyristor, while the negative pole of said d.c. power supply source is connected to the gate of said gate turn-off thyristor through said first switching element and said diode; and

a transformer having a primary winding and a secondary winding both wound with the same polarity, one end of said primary winding being connected to the cathode of said diode through a resistor while the other end of said primary winding is connected to the cathode of said gate turn-off thyristor, and one end of said secondary winding being connected to the anode of said diode through a second switching element while the other end of said secondary winding is connected to the cathode of said gate turn-off thyristor.

4,297,595

SIGNAL REGENERATING CIRCUIT WITH IMPROVED INPUT-OUTPUT ISOLATION

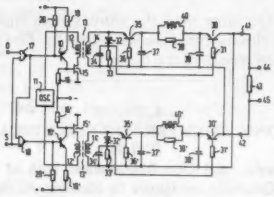
Josef Huellwegen, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,136

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826897

Int. Cl.³ H03K *5/01*

U.S. Cl. 307—268 **9 Claims**



1. In a regenerating system for generating output signals at a system output terminal corresponding to data signals applied at a system input terminal, said system having transformer means having a primary and a secondary winding, means connected to said primary winding for applying thereto high frequency signals modulated by said data signals, main rectifier means connected to said secondary winding for rectifying said modulated high frequency signals, thereby creating first rectified signals constituting said output signals, and buffer circuit means having a high impedance and a low impedance in the absence and presence of a control signal, respectively: the improvement comprising

additional rectifier means connected to said secondary winding for rectifying said modulated high frequency signals, thereby creating additional rectified signals:

and connecting means for connecting said additional rectifier means to said buffer circuit means so that said additional rectified signals constitute said control signals.

4,297,596

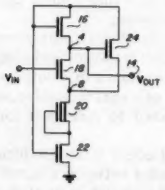
SCHMITT TRIGGER

Kim Eckert, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1979, Ser. No. 35,050

Int. Cl.³ H03K *3/295, 3/356*

U.S. Cl. 307—279 **2 Claims**



1. A MOS Schmitt trigger circuit comprising:

a first field effect transistor of the enhancement type and having a drain and a gate coupled to a first potential, and a source coupled to an output terminal;

a second field effect transistor of the enhancement type and having a drain coupled to the source of the first transistor, a gate coupled to an input terminal, and a source;

a third field effect transistor of the depletion type and having

a drain coupled to the source of the second transistor, a gate, and a source;

a fourth field effect transistor of the enhancement type and having a drain coupled to the gate and source of the third transistor, a gate coupled to the first potential, and a source coupled to a second potential; and

a fifth field effect transistor of the enhancement type and having a drain coupled to the first potential, a gate coupled to the drain of the second transistor, and a source coupled to the drain of the third transistor.

4,297,597

DARLINGTON-CONNECTED SEMICONDUCTOR DEVICE

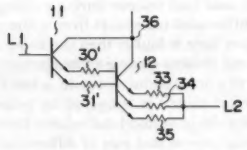
Takashi Kimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 13, 1979, Ser. No. 48,003

Claims priority, application Japan, Jun. 20, 1978, 53/73734

Int. Cl.³ H03K *3/26;* **H01L** *29/72*

U.S. Cl. 307—315 **6 Claims**



1. A Darlington-connected semiconductor device for amplifying an input signal, comprising:

a pre-stage transistor circuit portion including at least one pre-stage transistor with a plurality of emitters, a collector, and at least one base;

input terminal means connected to the base of said pre-stage transistor for receiving an input signal to be amplified by said device;

a rear-stage transistor circuit portion including at least one rear-stage transistor with a plurality of bases and emitters, said rear-stage transistor having a collector in common with said collector of said pre-stage transistor;

a plurality of resistors connected respectively between the emitters of said pre-stage transistor and the bases of said rear-stage transistor, to connect said input terminal means to the bases of said rear-stage transistor through the emitters of said pre-stage transistor and said resistors; and

output terminal means connected to the emitters of said rear-stage transistor for receiving an amplified form of said input signal.

4,297,598

I^2L SENSING CIRCUIT WITH INCREASED SENSITIVITY

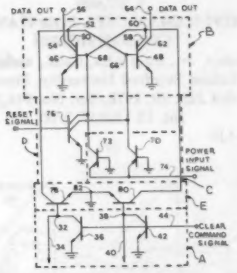
Kent F. Smith, Salt Lake City, Utah, assignor to General Instrument Corporation, Clifton, N.J.

Filed Apr. 5, 1979, Ser. No. 27,507

Int. Cl.³ H03K *5/24;* **G11C** *7/00*

U.S. Cl. 307—355 **35 Claims**

1. An I^2L circuit for sensing relatively small differences in signal magnitude between first and second input signals comprising first and second means adapted to receive the first and second input signals, respectively; dual input bistable means for generating an output representative of the relative degree of actuation of said bistable means inputs, subsequent to the resetting of said bistable means; means for supplying current to said bistable means to energize same; means for resetting said bistable means; and means, operably connected to said bistable means inputs and said receiving means, for actuating said bistable means inputs, respectively, to degrees dependent upon the



relative magnitudes of the signals applied at said first and second receiving means.

4,297,599

CIRCUIT ARRANGEMENT FOR OBTAINING AN INTERFERENCE-FREE TRIGGER SIGNAL ESPECIALLY FOR A FUEL APPORTIONMENT DEVICE IN AN INTERNAL COMBUSTION ENGINE

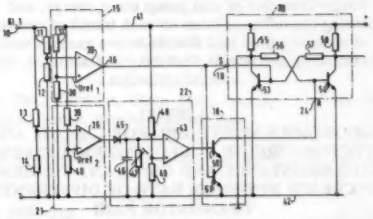
Peter Werner, Wiernsheim-Iptingen; Ulrich Drews, Vaihingen-Pulverdingen; Theodor Elbers, Krofdorf-Gleiberg, and Klaus Jäckel, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,743

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847290

Int. Cl.³ H03K *5/153, 19/20*

U.S. Cl. 307—355 **8 Claims**



1. In an interference-free triggering circuit, for regulating ignition current signals to an electronic fuel apportionment device for an internal combustion engine, the triggering circuit including:

a first threshold switch to which a first current signal is applied to generate an output if a first threshold value is exceeded by the first current signal;

a second threshold switch to which a second current signal is applied to generate an output if a second threshold value is exceeded by the second current signal;

a time-lag circuit connected to the second threshold switch to receive and delay the second threshold output;

a logic circuit, connected to the first threshold switch and the time-lag circuit to receive the output of the first threshold switch and the output of the time-lag circuit such that the logic circuit generates a reset signal only when the logic circuit receives no output from the first threshold switch and no output from the time-lag circuit; and

a switching element, connected to the first threshold switch and the logic circuit such that the switching element is set by the first threshold switch output and is reset by the

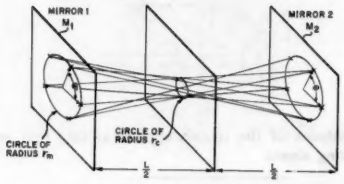
logic circuit reset signal to generate a command signal to the fuel apportionment device.

4,297,600

MULTIPATH RAMAN CELL FOR WAVELENGTH CONVERSION

William R. Trutna, Jr., Palo Alto, Calif., assignor to Board of Trustees of Leland Stanford University, Stanford, Calif.

Filed Jun. 19, 1978, Ser. No. 916,592
Int. Cl.[2] H03F 7/00
U.S. Cl. 307—426 8 Claims



1. In a method for wavelength conversion by Raman scattering, the steps of:

directing a beam of pumping optical radiation of a wavelength greater than 1 micron into an optical resonator defined by the space between a pair of optical reflectors, said beam of optical radiation being directed into the optical resonator at an angle to the optical axis of the resonator such that the optical beam is caused to be reflected to and fro within said resonator between said reflectors over a path which includes a plurality of transits of said resonator and which path walks over the surfaces of the reflectors and out of said resonator;

filling a region of space within said resonator with a Raman active gaseous medium for interaction with said beam of optical radiation for converting pump energy into stimulated Raman scattering radiation of a Stokes wavelength longer than that of said pump wave energy; and

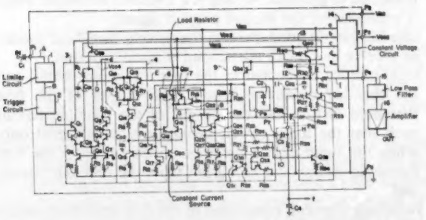
focusing the reflected beam on each transit of said resonator at a point within said Raman active gaseous medium for enhancing the Raman scattering interaction.

4,297,601

MONOSTABLE MULTIVIBRATOR CIRCUIT AND FM DETECTOR CIRCUIT EMPLOYING PREDETERMINED LOAD RESISTANCE AND CONSTANT CURRENT TO INCREASE RESPONSE RATE OF DIFFERENTIAL TRANSISTOR PAIR

Takeshi Wada, Kodaira; Yasuo Kominami, Kokubunji; Yukihiko Miyamoto, and Tsuneo Yamada, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Trio Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 16, 1979, Ser. No. 3,962
Claims priority, application Japan, Mar. 15, 1978, 53/28663
Int. Cl.[3] H03K 5/12, 3/284
U.S. Cl. 307—555 5 Claims



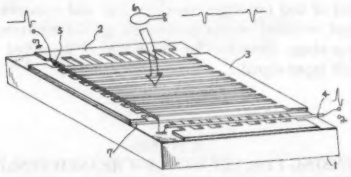
1. In a monostable multivibrator circuit having: a time constant circuit which includes a capacitor; an amplifier circuit connected to receive an output signal of the time constant circuit; a positive feedback circuit which is connected between an output of said amplifier circuit and an input of said time constant circuit and which comprises a pair of differential transistors, a constant-current circuit including a constant-current transistor the collector of which is connected to the emitters of said pair of differential transistors and a load resistor connected to the collector of one of the pair of differential transistors, means for supplying the base of said one of said pair of differential transistors with an output signal from the output of said amplifier circuit and means for transmitting the voltage at said load resistor to said input of said time constant circuit; and trigger input terminal means coupled to a circuit loop including said time constant circuit, said amplifier circuit and said positive feedback circuit and to which a trigger signal is applied, characterized in that clamp circuit means is coupled to said one of the differential transistors for clamping the collector potential of said one of said differential transistors to a value higher than the base input potential thereof, wherein said constant-current circuit includes means for setting the constant collector current of said constant-current transistor and the resistance of said load resistor is set so that the falling rate of the voltage at said load resistor during a change of said one of said pair of differential transistors from a non-conductive state to a conductive state is higher than the rising rate of the voltage at said load resistor during a change thereof from a conductive state to a non-conductive state, whereby said monostable multivibrator circuit is triggered by a leading edge in a change of the voltage at said load resistor from a non-conductive state of said one of said pair of differential transistors to a conductive state thereof.

4,297,602

MAGNETOSTRICTIVE CO-ORDINATE PLATE FOR CO-ORDINATE READER

Toshihiko Kobayashi, Mitaka, and Tetsusaburo Kamibayashi, Niza, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 14,736, Feb. 23, 1979, abandoned, which is a continuation of Ser. No. 775,465, Mar. 8, 1977, abandoned. This application Mar. 12, 1980, Ser. No. 129,575
Claims priority, application Japan, Mar. 10, 1976, 51-25870; Apr. 23, 1976, 51-46226
Int. Cl.[3] H01L 41/12
U.S. Cl. 310—26 16 Claims



1. A co-ordinate plate for a co-ordinate reader, comprising: a pair of thin sheets of magnetostrictive material, each of said sheets of magnetostrictive material having a dimension defined by a preferred direction of magnetostrictive oscillating wave propagation within a sheet, and said pair of sheets of magnetostrictive material superposed and oriented with their respective preferred directions of magnetostrictive oscillating wave propagation defining respective co-ordinate axes of a co-ordinate system; an acoustically insulating sheet of material disposed between said pair of sheets of magnetostrictive material for keeping said pair of sheets of magnetostrictive material from contacting each other, and said pair of thin sheets and said acoustically insulating sheet disposed with said pair of

thin sheets of magnetostrictive material in contact with said acoustically insulating sheet to define a co-ordinate plane; and exciting means for producing magnetostrictive oscillating waves propagating in the respective preferred directions of propagation in said pair of sheets of magnetostrictive material.

4,297,603

ARRANGEMENT FOR COOLING THE ROTOR OF AN ELECTRIC MACHINE WITH A SUPERCONDUCTING FIELD WINDING

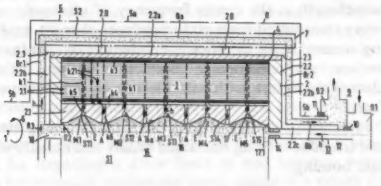
Erich Weghaupt, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,432

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849602

Int. Cl.[3] H02K *9/00*

U.S. Cl. 310—53 6 Claims



1. Arrangement for cooling the rotor of an electric machine, comprising a superconducting field winding, at least one cold shield surrounding said field winding, and a co-rotatable mixing chamber containing a phase mixture of coolant fed thereto from outside said rotor, said coolant mixture having a liquid level and branching into a first stream of liquid coolant for cooling said field winding and a second stream of at least partially evaporated coolant for cooling said cold shield, said second coolant stream being conducted from said mixing chamber through said cold shield and returned from the machine in an outer loop, said first coolant stream being conducted through a multiplicity of parallel-connected open thermal-syphon inner loops from said mixing chamber, through cooling canals subdivided into corresponding cooling canal sections of winding conductors of said field winding, and returned to said mixing chamber, said coolant in said inner and outer loops being transported by the self-pumping effect of rotation of said rotor, said inner loops having radial entrance and exit branches distributed over the length and circumference of said rotor and field winding, mixing chamber sections associated with said respective inner loops, said mixing chamber sections having a given axial length and radial height forming collecting pockets leading into said entrance branches for coolant which is colder than the average temperature of the liquid phase and produced by evaporation at said liquid level, means for fanning-up a directional thermal-syphon loop flow from weight and pressure differences of said radial coolant canal sections of said respective inner loops, said mixing chamber sections being distributed over the axial length and inner circumference of said rotor in accordance with the placement of said thermal-syphon inner loops, and being disposed concentrically about the central longitudinal axis of said mixing chamber of said rotor, each of said mixing chamber sections having at least one loop entrance point spaced from the axis, and at least one loop exit point in vicinity of a thermal-syphon inner loop.

4,297,604

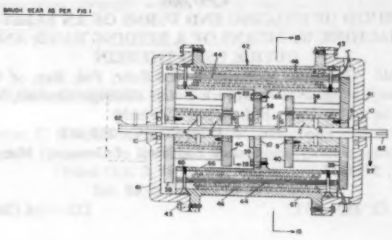
AXIAL AIR GAP ALTERNATORS/GENERATORS OF MODULAR CONSTRUCTION

Ian S. Tawse, Weston, Canada, assignor to Gen-Tech, Inc., Miami, Fla.

Filed May 11, 1979, Ser. No. 38,251

Int. Cl.[3] H02K *21/38*

U.S. Cl. 310—168 14 Claims



1. An electrical generator comprising:

(a) a generally cylindrical casing including two radially spaced-apart walls,

(b) a plurality of individual elongated magnetic cores located between the casing walls, each core having an electrical coil wound around it, the cores and coils defining the stator of the generator,

(c) a rotor within the inner of the casing walls, the rotor being rotatable about an axis parallel to the axis of the casing, the rotor having a plurality of radially projecting magnetic pole pieces, the magnetic pole pieces extending into axial alignment with the magnetic cores and being axially spaced from the ends of those cores,

(d) whereby as the rotor rotates the magnetic cooperation between the pole pieces and cores generates electric current in the stator coils on the cores.

4,297,605

BRUSH ASSEMBLIES FOR ELECTRIC MOTORS OR GENERATORS

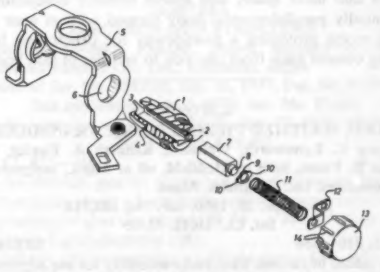
Shiu M. Tak, Kowloon, Hong Kong, assignor to Wah Ming Electrics Limited, Kowloon, Hong Kong

Filed Jan. 22, 1980, Ser. No. 114,317

Claims priority, application United Kingdom, Oct. 30, 1979, 37524/79

Int. Cl.[3] H02K *13/00*

U.S. Cl. 310—242 4 Claims



1. A brush assembly for one of an electric motor and an electric generator, comprising a brush having a first end for contacting a commutator of the one of the motor and the generator and a second end, a holder for said brush, a contact for connection to a supply of electrical power, conductive restraining means disposed at said second end of said brush, and a conductive spring having a first end which abuts against

said restraining means and a second end which abuts against said contact, whereby said spring urges said brush against the commutator, said restraining means prevents said first end of said spring from contacting the commutator when said brush has worn away, and said spring and said restraining means provide a conductive path between said contact and said brush.

4,297,606

METHOD OF BRACING END TURNS OF AN ELECTRIC MACHINE BY MEANS OF A BINDING BAND; AND DEVICE USED THEREIN

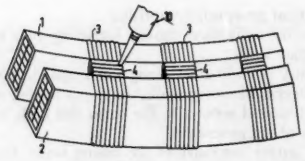
Arnold Wichmann, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 889,003

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713847

Int. Cl.³ H02K *3/48*

U.S. Cl. 310—271 **4 Claims**



1. In a device for bracing winding end turns of an electric machine wherein a pair of winding bars forming the end turns are disposed spaced from and substantially parallel to one another, a spacer member disposed between and contacting the winding bars and defining and predetermining the spacing between the pair of winding bars, a first binding tape wrapped transversely around the pair of winding bars at the location of said spacer member, a second binding tape wrapped transversely about the wrapped first binding tape in the space between the pair of winding bars, the wrapped first and second binding tapes and mutually opposing surfaces of the parallel winding bars defining a substantially closed inner space therewithin wherein said spacer member is disposed, and a cold hardened, flowable-type cement mass injectedly received in said inner space, said spacer member having a shape affording penetration by said flowable-type cement from a given injection point to every part of said inner space unoccupied by said spacer member and to all surfaces defining said unoccupied part of said inner space, said spacer member comprising a substantially parallelepipedal body formed with at least one lateral recess providing a passageway for penetration by a flowing cement mass from one side to another of said body.

4,297,607

SEALED, MATCHED PIEZOELECTRIC TRANSDUCER

Lawrence C. Lynnworth, Waltham; Kenneth A. Fowler, and Dana R. Patch, both of Medfield, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Apr. 25, 1980, Ser. No. 143,714

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—334 **50 Claims**

1. A sealed ultrasonic transducer assembly for use adjacent a fluid of characteristic acoustic impedance Z_4, comprising,

an electroacoustic transducer element having a front surface and a rear surface and a characteristic acoustic impedance Z_1,

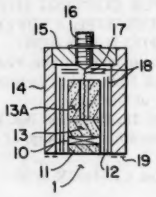
an impedance-transforming matching element positioned in contact with the front surface of said transducer element,

an electrically conductive shielding housing having an aperture for transmitting ultrasonic radiation from said transducer assembly, and

a sealing element enclosing said aperture and hermetically sealed to said housing,

said matching element being formed of a non-resilient material having an effective characteristic impedance intermediate between that of said transducer element and said fluid;

said sealing element having an acoustic impedance higher than that of said matching element by a factor of at least 2



and having a thickness between 1/10th and 1/1000th of a wavelength at the center frequency of ultrasonic waves being transmitted from said transducer element, said sealing element being electrically conductive over at least one surface, said electrically conductive housing being in electrical contact with said electrically conductive surface;

the combination of said sealing element, matching element and transducer being restrained axially and radially within said housing.

4,297,608

MEASURING EQUIPMENT FOR ACOUSTIC DETERMINATION OF THE SPECIFIC GRAVITY OF LIQUIDS

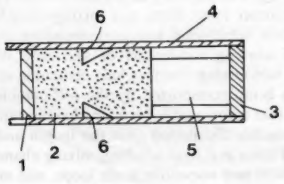
Borge R. Jensen, Kobenhavn, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed May 1, 1980, Ser. No. 145,620

Claims priority, application Denmark, May 10, 1979, 01924/79

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—335 **1 Claim**



1. A measuring probe for the acoustic determination of the specific gravity of a liquid, comprising, a holder having a piezoelectric ceramic disc attached at one end thereof and a parallel arranged reflection disc attached at the other end thereof, a reference element having parallel end faces and a known acoustical impedance, said reference element having one of said end faces in abutting engagement with said piezoelectric disc and the other of said end faces in spaced relation to said reflection disc to form a sampling space therebetween, said reference element having an annularly shaped groove formed therein intermedite said end faces and having a planar surface adjacent to and parallel to said ceramic disc, said holder having wall means bounding and surrounding said annular groove, and said wall means forming an opening to

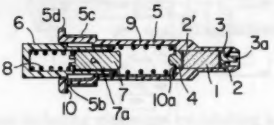
provide ingress and egress to and from said sampling space for a medium externally of said probe.

4,297,609

HIGH-VOLTAGE GENERATING DEVICE

Tsuneo Hirao, and Masao Onishi, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 3, 1980, Ser. No. 137,007
Claims priority, application Japan, Apr. 6, 1979, 54-46078[U]
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—339 **4 Claims**



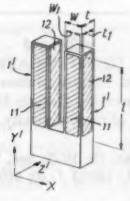
1. A high-voltage generating device comprising a piezo-electric element, a driven member of an electrical conductor disposed on one side of said piezo-electric element, an abutment member of an electrical conductor disposed on the other side of said piezo-electric element, an outer casing of an electrical insulator accommodating said piezo-electric element therein in such a relation that said conductive abutment member is partly exposed to the exterior of said outer casing, an inner casing telescopically received in said outer casing, said inner casing accommodating therein a hammer for imparting an impact to said conductive driven member and a hammer spring for imparting a drive force to said hammer, a return spring for normally biasing said inner casing in a return direction in which said inner casing protrudes partly from said outer casing, and a strip of an electrical conductor pressed at one end thereof against said conductive driven member by said return spring and exposed at the other end thereof to the exterior of said outer casing.

4,297,610

SMALL PIEZOELECTRIC TUNING FORK

Kunimoto Ito, 37-9, 1-chome, Kikunodai, Chofu-shi, Tokyo; Tsutomu Kakizawa, 23-17, 2 chome, Miyasaka, Setagaya-ku, Tokyo; Kengo Yonetani, 23-17, 2 chome, Miyasaka, Setagaya-ku, Tokyo, Japan, and Hiroshi Nariai, 23-17, 2-chome, Miyasaka, Setagaya-ku, Tokyo, all of Japan

Continuation-in-part of Ser. No. 709,067, Jul. 27, 1976, abandoned, which is a continuation of Ser. No. 546,042, Jan. 31, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,964
Claims priority, application Japan, Feb. 4, 1974, 49-14354; Jan. 17, 1975, 50-7023
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—370 **1 Claim**



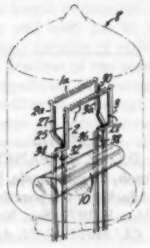
1. A piezoelectric flection vibrator which comprises a tuning fork-type quartz vibrator body having a pair of leg members extending from the base portion of said vibrator body, the lengths of said leg members being equal to each other, said base portion of said vibrator body and said leg members including a pair of generally U-shaped principal faces positioned in parallel to each other, each said leg member having a pair of side faces each extending between and connecting said principal faces perpendicularly to each other, each said side face and each face on said leg members included in a said principal face of the vibrator body being provided with an electrode formed thereon, characterized in that said length of said leg member is less than six millimeters and the ratio t/w where t and w are the thickness and the width respectively of said leg member is chosen at a value less than one, whereby the point of zerotemperature coefficient of said vibrator body is set at a temperature appearing normally within a wrist watch carried on the human body.

4,297,611

CONTROL OF TUNGSTEN FILAMENT EROSION IN A HALOGEN LAMP

Salvatore F. Cortorillo, Parsippany, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Oct. 2, 1979, Ser. No. 81,270
Int. Cl.³ H01K *1/50, 1/18*
U.S. Cl. 313—222 **11 Claims**



1. In an incandescent lamp of the type having at least two operative tungsten filaments in a bulb enclosing an atmosphere containing a halogen gas, the improvement comprising an inoperative surrogate filament within said bulb comprising a tungsten surface positioned in a region near said tungsten filaments to passively receive chemical attack by said halogen gas whereby said operative tungsten filaments are at least partially protected from attack by said halogen gas and wherein said operative tungsten filaments have two support legs each, said inoperative surrogate filament comprises four tungsten wires, one each positioned near a support leg, each said tungsten wire separated a small distance from said support leg and extending substantially parallel to its associated support leg.

4,297,612

ELECTRON GUN STRUCTURE

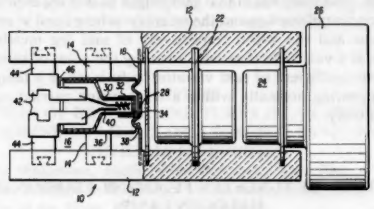
Yoshimitsu Anezaki, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 835,062, Sep. 21, 1977, Pat. No. 4,185,223. This application Apr. 4, 1979, Ser. No. 27,036
Claims priority, application Japan, Sep. 27, 1976, 51-114645
Int. Cl.³ H01J *29/02*
U.S. Cl. 313—446 **5 Claims**

1. An electron gun for producing and directing at least one electron beam along a beam path; said structure comprising:
- a plurality of grid electrodes (**18**, **20** . . . **26**) including a first control grid electrode (**18**),
- a cathode (**16**) comprising a cathode sleeve (**30**), which has an open end and a closed end having an electron emissive coating (**34**) adjacent to the first control grid electrode,
- a heater comprising a heater coil (**40**) made of thin wire,
- and, heater supporting straps (**42**), which support said heater positioned within said cathode sleeve, having an arcing induction means (**46**) confronting the open end of said cathode sleeve, wherein:

the open end of said cathode sleeve extends toward said

arcing induction (46) means of said heater supporting straps so that the distance between them is smaller than the distance between said cathode sleeve and said heater



coil in order to make an arc between cathode sleeve and said heater supporting straps before inducing an arc between said cathode and the heater coil.

4,297,613

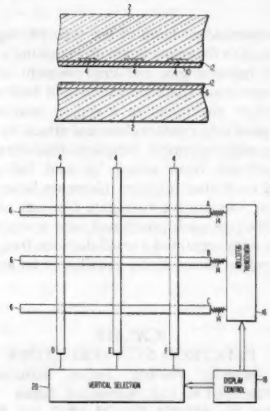
D.C. SCAN PANEL

Mohamed O. Aboelfotoh, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1979, Ser. No. 37,082

Int. Cl.³ H01J *17/34, 61/067*

U.S. Cl. 315—58 **14 Claims**



1. In a d.c. gaseous discharge display device,

an ionizable gaseous medium in a gas chamber formed by a pair of glass plates,

a plurality of cathode conductors orthogonal to said anode conductors and disposed on a surface of the other of said glass plates,

a quantity of material overlying said cathode conductors to protect said cathode conductors from sputtering during gaseous discharge, said material comprising a doped mixture of a refractory oxide insulator and a metal dopant, said doped refractory oxide material having sufficient conductivity to prevent the build-up of a surface wall charge during d.c. operation of said display device and having sufficient secondary emissivity to reduce the voltage required to sustain gaseous discharge.

4,297,614

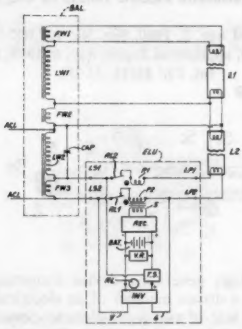
EMERGENCY LIGHTING SYSTEM

Edward A. Chandler, Montreal, Canada, assignor to Kaufel Group Ltd., Montreal, Canada

Filed Mar. 12, 1980, Ser. No. 129,696

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—86 **6 Claims**



1. For use with an electric discharge lamp in a fixture, said lamp having a first input terminal and a second input terminal; an emergency lighting unit comprising:

a transformer, having two closely coupled windings constituting the primary of said transformer, and a secondary winding,

first adjacent ends of said coupled windings comprising the input of said emergency lighting unit, and second adjacent ends of said coupled windings comprising the output terminals of said emergency lighting unit;

said input terminals of said emergency lighting unit being adapted to be connected to a source of ac power;

said output terminals of said emergency lighting unit being adapted to be connected to respective ones of said first and second input terminals of said lamp;

whereby each one of said closely coupled windings is in a different line between said source of ac power and a respective one of said first and second input terminals of said lamp;

rectifier means connected across the output of said secondary winding;

rechargeable battery means connected across the output of said rectifier means and being rechargeable by the dc output thereof;

inverter means connected in parallel with said battery means and adaptable to convert the dc output of said battery means to an ac signal; and

means for sensing a loss of ac power from said source of ac power and to, upon such sensing, connecting said inverter in circuit with said input terminals.

4,297,615

HIGH CURRENT DENSITY CATHODE STRUCTURE

Dan M. Goebel, Santa Monica; James T. Crow, Los Angeles, and A. Theodore Forrester, Beverly Hills, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 19, 1979, Ser. No. 21,461

Int. Cl.³ H01J *1/20;* **H05H** *1/24*

U.S. Cl. 315—111.21 **16 Claims**

1. A system including a compact cathode assembly having high electron emission current densities for producing a dense gas plasma, comprising:

a high plasma density cathode enclosure;

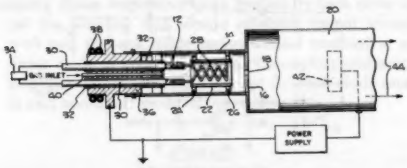
inlet means connected to said cathode enclosure for supplying gas to said cathode enclosure;

a low plasma density utilization chamber coupled to receive

plasma from said cathode enclosure through a restricted opening between said enclosure and said chamber;

a cathode element of lanthanum hexaboride having an emitting surface exposed within said cathode enclosure;

means for heating said lanthanum hexaboride element to an elevated temperature from a surface of said lanthanum hexaboride away from the emitting surface, whereby contamination of said emitting surface is avoided;



said system including means for establishing a high plasma density, in the order of 2×10^{12} electrons per cubic centimeter or more, within said cathode enclosure, substantially higher than in said utilization chamber;

power supply means for drawing current densities greater than five amperes per square centimeter from the emitting surface of said lanthanum hexaboride cathode; and

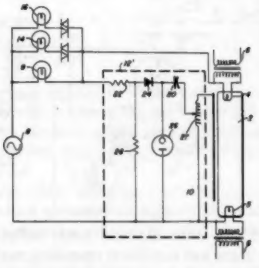
means for mounting said lanthanum hexaboride cathode on carbon material support arrangements.

4,297,616

FLUORESCENT LAMP WITH INCANDESCENT BALLASTING SYSTEMS

Stephen C. Corona, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 17, 1980, Ser. No. 130,929
Int. Cl.³ H05B *35/00, 41/19*
U.S. Cl. 315—179 **9 Claims**



1. An incandescent ballasting circuit for a fluorescent lamp comprising:

at least one incandescent device connected between an electrical power source and fluorescent lamp,

means for applying a preheat voltage to the fluorescent lamp filaments, and

means for applying a trigger voltage to said fluorescent lamp sufficient to initiate lamp discharge

said triggering voltage means including:

a conductive plane adjacent to said fluorescent lamp,

a transformer electrically connected to said conductive plane, and

a pulse generating circuit connected between said incandescent device and said transformer, said circuit adapted to operate from said power source to generate a high voltage pulse and apply said pulse to said lamp via the transformer and conductive plane, initiating lamp discharge,

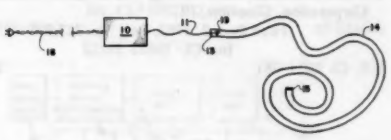
said circuit means further adapted to be disabled following initiation of lamp discharge.

4,297,617

LIGHT PRODUCING DEVICE

Charles E. Galaspie, Rte. 1, Box 353, Bumpass, Va. 23024

Filed Mar. 24, 1980, Ser. No. 132,742
Int. Cl.³ H01J *61/30*; H05B *41/26*
U.S. Cl. 315—326 **7 Claims**



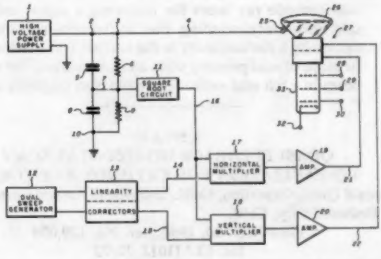
1. A light producing device comprising an elongated flexible transparent thermoplastic tube having sealed proximal and distal ends and containing an electrically excitable gas, and an electrical supply which associates with said proximal end, said tube having a substantially uniform cross sectional configuration along its length, a length to diameter ratio in excess of 20, a flexibility such that said ends can be readily brought into contact, a wall thickness capable of resisting collapse of said tube under a pressure gradient of one atmosphere, and a transparency such that a significant percentage of the light generated within said tube will emerge through the wall of said tube, said electrically excitable gas being a mono or polyatomic gas or gas mixture at a pressure of between about 1 and 7 mm Hg., said electrical supply providing an output current which is a pulsed direct current of sub-ampere intensity having a peak voltage between 20,000 and 50,000 volts and a pulse frequency of about 60 pulses per second, said output current being directed by a single electrical conductor to a pointed metal electrode protruding through the proximal end of said tube and coaxial therewith, and thermal shielding means annularly disposed between said electrode and the adjacent wall of said tube.

4,297,618

ANODE VOLTAGE DEFLECTION GAIN CONTROL FOR CATHODE RAY DISPLAYS

Thomas W. Spilsbury, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,039
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—371 **8 Claims**



1. Cathode ray display apparatus including a cathode ray display tube having at least anode means, cathode means, and associated electron beam deflection coil means, power supply means for supplying an anode voltage to said anode means,

sampling circuit means for deriving a sample of said anode voltage,

square root signal extractor means responsive to said anode voltage sample,

circuit means for generating a sweep signal, and

multiplier means responsive to said square root signal and to said sweep signal for generating a compensated electron

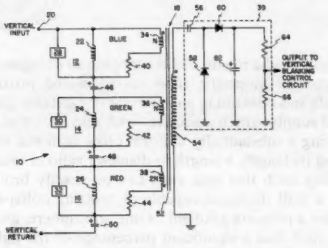
beam deflection current for driving said electron beam deflection coil means.

4,297,619

PHOSPHOR PROTECTION CIRCUIT FOR MULTIPLE CRT PROJECTION TELEVISION

Terence J. Kiteley, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 2, 1981, Ser. No. 222,205
Int. Cl.³ H01J *29/52*
U.S. Cl. 315—381 **24 Claims**



1. In a projection color television system having a projecting screen, three cathode ray tubes each having a phosphor screen for producing, by means of an electron beam incident upon said phosphor screen, and projecting onto said projecting screen a different one of the three primary colors of a light beam containing image information therein, and a vertical deflection coil in each of said cathode ray tubes for deflecting said electron beams across said projecting screen in a vertical direction by means of vertical deflection signals provided to said deflection coils, a protection system comprising:

means for connecting said vertical deflection coils serially;

transformer means including a core, three primary windings each connected in parallel across one of said vertical deflection coils and a secondary winding coupled inductively to said primary windings, with two of said primary windings each having N turns and a first winding polarity and the third primary winding having 2 N turns and a second winding polarity opposite to said first polarity, such that said transformer is balanced when all of said deflection coils transmit said vertical deflection signals with no signal induced in said secondary winding; and

shutdown means coupled to said secondary winding and to said cathode ray tubes for receiving a signal induced in said secondary winding due to transformer imbalance caused by a discontinuity in the current transmitted by one or more of said primary coils and terminating the electron beam in each said cathode ray tubes in response thereto.

4,297,620

QUASI FEEDBACK HORIZONTAL SCAN LINEARIZATION FOR CATHODE RAY TUBES

Ronald Quan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

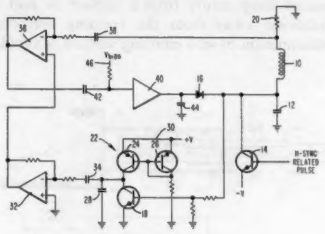
Filed Mar. 10, 1980, Ser. No. 129,059
Int. Cl.³ H01J *29/72*
U.S. Cl. 315—389 **5 Claims**

1. A scan circuit for linearizing the non-linear yoke current during the horizontal scan interval of a horizontal scan circuit including a yoke and serial switching transistor, comprising the combination of;

a current sensing resistor in series with the yoke for generating a non-linear voltage ramp commensurate with the non-linear yoke current;

a resonating capacitor coupled to the yoke oppsoite the sensing resistor;

linear ramp generator means coupled to the yoke opposite the sensing resistor and including a holding capacitor and transistor means coupled thereto, wherein the ramp generator means generates a linear voltage ramp in response to a reset pulse due to the yoke inductance during the flyback interval of the horizontal scan; and



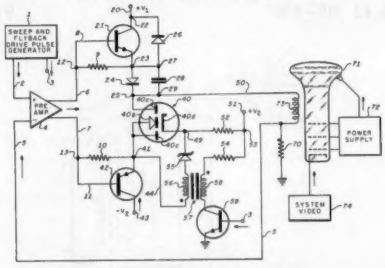
feedback means including the ramp generator means and a damper diode coupled to the yoke opposite the sensing resistor for selectively feeding back the linear voltage ramp to the yoke circuit during the first half of a selected line scan interval to linearize the corresponding non-linear yoke current.

4,297,621

CATHODE RAY TUBE BEAM DEFLECTION AMPLIFIER SYSTEM

Thomas W. Spilsbury, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 193,236
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—397 **6 Claims**



1. A cathode ray tube electron beam deflection control system having linear and non-linear operating modes, comprising:

deflection coil means;

preamplifier means having an input terminal and first and second output terminals, said input terminal responsive to an input sweep signal during said linear mode of operation;

first amplifier means having input and output terminals, said input terminal being coupled to said first output terminal of said preamplifier, for amplifying the current received therefrom;

second amplifier means having input and output terminals, said input terminal being coupled to said second output terminal of said preamplifier, for amplifying the current received therefrom;

fly-back diode means having first and second terminals, said first terminal coupled to said amplifier output terminal for unidirectionally conducting current received from said amplifier output terminal to said flyback diode second terminal;

diode means having first and second terminals, said first

terminal coupled to a first power supply having a first voltage potential and said second terminal coupled to said second amplifier output terminal, for unidirectionally coupling current to said first power supply from said diode means second terminal

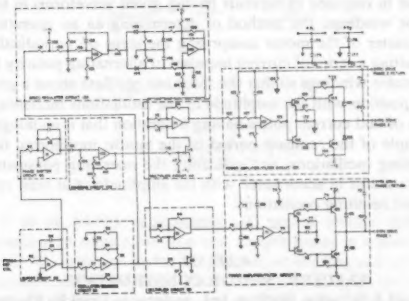
fly-back capacitor means coupled in series relationship with said diode means and in shunt relationship with said fly-back diode means and further coupled to said deflection coil; and

switcing means responsive to an applied fly-back drive signal for coupling said second amplifier output terminal with said fly-back diode means second terminal in said linear mode of operation and for decoupling said second amplifier output terminal with said fly-back diode means in said non-linear mode of operation.

4,297,622
MOTOR DRIVE

Charles C. Dittman, Dallas, Tex., and Richard C. St. Clair, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1979, Ser. No. 88,498
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—254 **3 Claims**



1. A two phase sequential bipolar analog drive with closed loop speed control in a motor having a plurality of windings as a stator which interacts with a permanently magnetized gyro rotor which is free to pivot and rotate relative to the stator comprising:

means place about said stator for sensing rotation of said stator which generates a single reference signal of known phase relationship to the plurality of windings of said stator;

means for generating a plurality of gyro motor drive signals properly phased to the rotation of said gyro rotor based on said reference signal comprising:

a buffer circuit receiving said reference signal for filtering and amplifying said reference signal to a predetermined output signal from said buffer circuit;

an oscillator/squaring circuit which inputs said buffer circuit output for emitting a predetermined driving pulse when said buffer output is beneath a present threshold frequency and for squaring up said buffer circuit output when it is above said present threshold frequency;

a phase shifter circuit which inputs said buffer circuit output for changing the phase of said buffer circuit output a predetermined amount when said buffer circuit output frequency is beneath a defined limit;

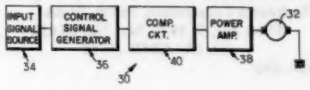
a squaring circuit connected to said phase shifter circuit for squaring up said phase shifted buffer circuit output and inputting it to said stator for driving said rotor; and

means for controlling the level of said plurality of gyro rotor drive signals based on said reference signal.

4,297,623
SYSTEM FOR CONTROLLING A SEPARATELY EXCITED CONSTANT LOAD DC ELECTRIC MOTOR

Jean M. Dupont, Paris, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Jun. 12, 1978, Ser. No. 914,987
Claims priority, application France, Jun. 20, 1977, 77 18874
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—410 **15 Claims**

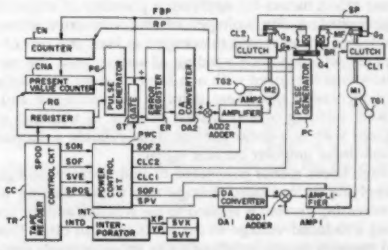


1. A system for controlling a separately excited constant load DC electric motor in response to a source of a control signal defining desired time periods corresponding to desired motor operating conditions and without the use for a feedback circuit responsive to exciting current supplied by the source to the motor, the motor exciting current having a term representing resistive and reactive losses in an electric circuit responsive to the exciting current, comprising simulator means for only the resistive losses, said simulator means being responsive to the control signal for modifying, during at least one of said desired time periods, the magnitude of the control signal in accordance with only the resistive losses the motor is expected to have in response to the control signal during said one time period, and means responsive to said modified control signal for applying a current that is a replica of the modified control signal to the motor armature, and independent of a response from any feedback circuit responsive to the motor armature current to preclude the need for any feedback circuit responsive to the armature current, said control signal being independent of actual motor operating current.

4,297,624
SPINDLE CONTROL SYSTEM

Hidetsugu Komiya, Hino, Japan, assignor to Fujitsu Fanuc Limited, Japan

Filed Apr. 27, 1979, Ser. No. 34,142
Claims priority, application Japan, Apr. 28, 1978, 53-51694
Int. Cl.³ G05B *11/18*
U.S. Cl. 318—594 **7 Claims**



1. A spindle control system for a spindle control arrangement including a first motor for driving a spindle and a second motor for positioning the spindle, comprising:

first clutch means for selectively coupling the first motor with the spindle;

second clutch means for selectively coupling the second motor with the spindle;

a pulse generator coupled with the spindle for generating pulses proportional in number to the rotational angle of the spindle;

counter means for counting the pulses from the pulse generator to detect the rotational position of the spindle; and

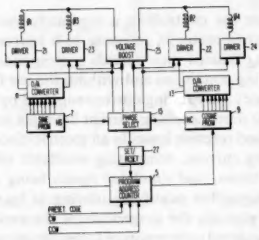
means responsive to the counter means for controlling the rotational positioning of the spindle by the second motor via the second clutch means with the first clutch means disconnected.

4,297,625

APPARATUS FOR DIVIDING THE STEP ANGLE OF A STEPPING MOTOR

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Filed Apr. 9, 1979, Ser. No. 28,618
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **1 Claim**



1. A step divider apparatus for dividing the primary step of a stepping motor having a plurality of phase windings, comprising:

means for generating input timing signals;

counting means for counting the number of input timing signals from a preset count state;

memory means for storing a plurality of digital words, each digital word defining an incremental current step portion of a non-linear current signal;

means for applying the count state of said counting means to access associated digital words of said memory means;

converter means for generating an analog voltage defined by an accessed digital word;

a driver means for each of said phase windings, each driver means responsive to at least a portion of an accessed digital word for passing a unipolar current that is proportional to the analog voltage associated with the digital word;

phase select means for applying a plurality of sequentially generated analog voltages of said converter means to selected driver means to energize at least one pair of said phase windings, one winding of said at least one pair of windings energized with non-linear current steps defining an increasing non-linear unipolar current signal and the other winding of said at least one pair of windings energized with non-linear current steps defining a decreasing non-linear unipolar current signal;

voltage boost means connected to said phase windings for applying an increased voltage to a phase winding when increasing current is applied to the winding and for applying a reduced voltage to the winding at all other times;

said memory means including a sine programmable memory having stored data words for defining the positive portion of a sine current waveform as a function of the number of input timing signals applied to said counting means and a cosine programmable memory having stored data words for defining the positive portion of a cosine current waveform as a function of the number of input timing signals applied to said counting means;

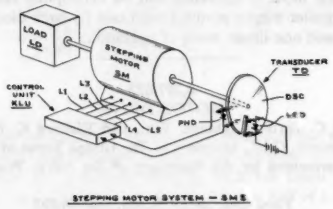
said motor having four phase windings and including counter reset means for defining a number n of count states of said counting means in an energization cycle for the motor, said number n being equal to the product of a selected step divider factor times four, the step divider factor being the number by which the step divider apparatus divides the primary step of the motor.

4,297,626

METHOD OF DETERMINING OPERATING CURRENTS FOR STEPPING MOTOR

David Chiang, 649 Caledonia Rd., Dix Hills, N.Y. 11746

Filed Feb. 7, 1980, Ser. No. 119,503
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **10 Claims**



STEPPING MOTOR SYSTEM — SMS

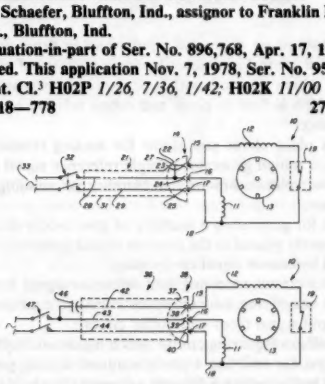
1. For a stepping motor having a rotor which is driven to rotate in response to currents having given waveforms in the stator windings, the method of determining an an operating parameter of the motor comprising the steps of: periodically imparting a series of current impulses of alternating polarity to the stator windings so that the rotor can oscillate about a give rest position with the amplitude of the oscillations increasing, each of said current pulses having a duration that is an integer multiple of the resonant period of the motor; monitoring the resulting oscillations; and indicating the operating parameter of the motor in accordance with the amplitude of at least one of said resulting oscillations.

4,297,627

ELECTRIC MOTOR CONSTRUCTION

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 896,768, Apr. 17, 1978, abandoned. This application Nov. 7, 1978, Ser. No. 958,534
Int. Cl.³ H02P *1/26, 7/36, 1/42;* H02K *11/00*
U.S. Cl. 318—778 **27 Claims**



1. In combination, an electric motor operable as a split phase or as a capacitor start motor, comprising an outer casing, a run winding circuit, a start winding circuit including a start winding cutout switch, said run and start winding circuits being mounted within said casing, power circuit means adapted to connect said start and run winding circuits to a power supply, said start winding and power circuits having an electrical gap formed therebetween, and removable interchangeable attachment means exterior of said casing and connectable to bridge

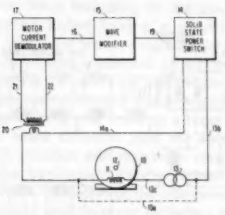
said gap, one of said attachment means causing said motor to operate as a capacitor start motor and another if said attachment means causing said motor to operate as a split phase motor.

4,297,628

ENERGY ECONOMIZER FOR INDUCTION MOTORS

Rhey W. Hedges, Ft. Lauderdale, Fla., assignor to Louis W. Parker, Fort Lauderdale, Fla.

Filed Jul. 3, 1980, Ser. No. 165,574
Int. Cl.³ H02P 7/36, 1/26
U.S. Cl. 318—798 37 Claims



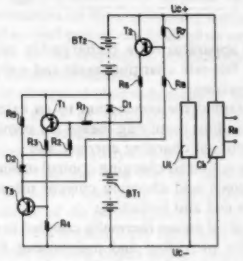
1. In an energy economizing AC power control system operative to reduce the iron and copper losses in a conventional AC induction motor having a stator winding and a rotor adapted to be coupled to a load, said system being of the type comprising a sine wave power source for energizing said stator winding to effect rotation of said rotor, and a nonlinear closed loop positive feedback control means conditionally operative to control the form and magnitude of energization of said stator winding from said power source, said feedback control means comprising motor load detecting means for producing a control signal which varies as a function of the load of said motor, wave modifier means responsive to said control signal, and switching means disposed between said sine wave power source and said stator winding, the conduction time of said switching means being controllable during each cycle of said power source as a function of said control signal to apply full sine waves of voltage from said power source to said stator winding during rotational start-up and speed build-up of said motor and, as said motor reaches a near synchronous speed, then being operative to provide varying fractions or complete cycles of each sine wave of voltage from said power source to said stator winding in accordance with the inherent electromechanical properties of said motor and the energy requirements imposed on said motor by the rotor load at any given moment, the improvement wherein said motor load detecting means comprises a motor current demodulator circuit coupled to said stator winding and jointly responsive to at least two load-related variations of the parameters of the inrush current to said stator winding each time the current in said stator winding increases from zero for producing said variations of said control signal, said parameters including the magnitude of the stator inrush current at the beginning of each current alteration and also including the instantaneous phase of said stator inrush current.

4,297,629

AUTOMATIC SWITCHING ARRANGEMENT FOR TWO BATTERIES WHICH ARE CHARGED IN PARALLEL AND DISCHARGED IN SERIES

Pierre Godard, Tremblay les Gonesse, and Michel Billot, Drancy, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Apr. 1, 1980, Ser. No. 136,355
Claims priority, application France, Apr. 13, 1979, 79 09469; Dec. 6, 1979, 79 29942
Int. Cl.³ H02J 7/04
U.S. Cl. 320—7 15 Claims



1. An automatic switching arrangement for connecting two batteries in parallel between a pair of power supply leads for charging and in series between the same power supply rails for discharging to supply power thereto in the event of a failure of a power supply to the said leads, the switching arrangement comprising:

positive and negative terminals for respective connection to said power supply leads;

first and second storage batteries, the negative pole of the first battery being connected to the negative terminal and the positive pole of the second battery being connected to the positive terminal;

first and second switchable charging circuits, the first switchable charging circuit being connected between the positive pole of the first battery and the positive terminal, and the second switchable charging circuit being connected between the negative pole of the second battery and the negative terminal;

unidirectionally conductive means connected in series between the positive pole of the first battery and the negative pole of the second battery in order to allow a discharge current to flow in series through the batteries but to prevent a charging current from flowing in series through the batteries; and

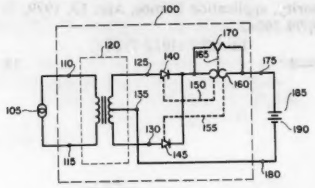
control means arranged to switch on said first and second switchable charging circuits when there is sufficient externally applied voltage at the positive and negative terminals for the batteries to be charged therefrom, and to switch off said switchable charging circuits otherwise to enable the batteries to supply power in series to said positive and negative terminals;

the control means including a first transistor connected to be turned on and off by the direction of the potential difference between the positive pole of the first battery and the negative pole of the second battery, and positive feedback means arranged to saturate the first transistor when it turns on.

4,297,630
TIMED FAST CHARGER

Ferdinand H. Mullersman, Gainsville, Fla., assignor to General Electric Company, Gainsville, Fla.

Filed Jun. 23, 1980, Ser. No. 162,152
Int. Cl.³ H02J *7/04*
U.S. Cl. 320—35 **9 Claims**



1. Charging apparatus for a rechargeable cell having a sequential timed fast-rate charging mode and a slow-rate charging mode comprising:

(a) means adapted for connection to an external electrical source including rectifying means for providing a source of unidirectional charging current; and

(b) thermally activated charging control means connected in series between said charging current means and said rechargeable cell and including:

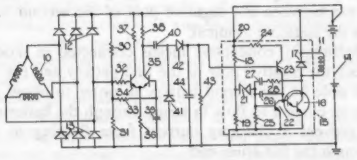
(1) first control means thermally coupled to said rectifying means for providing and maintaining for a predetermined period of time a fast-rate charging current path between said charging current means and said rechargeable cell, and

(2) second control means connected in parallel with, and thermally coupled to, said first control means for providing thereafter a slow-rate charging current path between said charging current means and said rechargeable cell.

4,297,631
BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

Thomas Nicol, Oxted; David Wiley, Walsall, and Maurice J. Allport, Edgbaston, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 7, 1980, Ser. No. 128,225
Claims priority, application United Kingdom, Mar. 16, 1979, 9372/79
Int. Cl.³ H02J *7/16*
U.S. Cl. 320—64 **6 Claims**

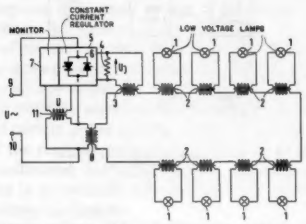


1. A battery charging system comprising an alternator having a stator winding and a field winding, rectifier means connecting the stator winding to the battery, a voltage regulator having an output stage connected in series with the field winding across the battery and an input stage coupled to the output stage and sensitive to the battery voltage so that, in use, the mean current in the field winding is controlled to maintain a desired battery voltage, and switch means sensitive to an a.c. signal derived from the alternator for preventing current flow through the field winding when the alternator is at rest, said switch means including a differential amplifier connected to detect the presence of an a.c. signal at the alternator output and a diode pump circuit driven by the output of said differential amplifier.

4,297,632
DEVICE FOR MONITORING LAMP FAILURE IN AIRPORT NAVIGATION LIGHTING

Helmut Glaser, Forchheim, and Ludwig Schick, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 52,843
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829135
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **6 Claims**



1. A device for monitoring lamp failures in an airport landing light system comprising:

a plurality of lamps each of which is supplied by a current transformer;

a high voltage transformer having a primary winding connected to an AC network via a constant current regulator and a secondary winding connected in series with the series-connected primary windings of the current transformers;

a current measuring transformer connected for measuring the current flowing in the primary windings of the current transformers;

a voltage measuring transformer for measuring the voltage on the primary winding of the high voltage transformer;

means for monitoring and indicating the percentage of failed lamps comprising a first sample-and-hold memory connected to the output of the current measuring transformer and a second sample-and-hold memory connected to the output of the voltage measuring transformer;

an extreme value detector for activating the sample-and-hold memories upon the occurrence of an extreme value in the output signal of the current measuring transformer;

a first proportional amplifier connected to the output of the first sample-and-hold memory;

means for taking the difference between the output of the second sample-and-hold memory and the first proportional amplifier and supplying it to a second proportional amplifier;

means for dividing the output of the second proportional amplifier by the output of the first proportional amplifier; and

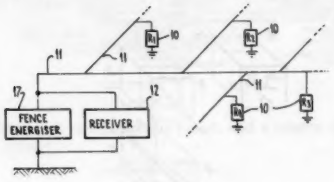
means responsive to the output of the dividing means for indicating the condition of the lamps.

4,297,633

ELECTRIC FENCE MONITORING SYSTEM WITH ENERGIZER, RESPONDER AND RECEIVER

John C. McCutchan, Lower Plenty, and Rex C. Niven, East Melbourne, both of Australia, assignors to The University of Melbourne, Parkville, Australia

Continuation of Ser. No. 923,348, Jul. 10, 1978, abandoned, which is a continuation of Ser. No. 753,903, Dec. 23, 1976, abandoned. This application Jul. 9, 1979, Ser. No. 56,004
Claims priority, application Australia, Dec. 23, 1975, PC4375
Int. Cl.[3] G01R *31/02;* G08B *26/00*
U.S. Cl. 324—51 9 Claims



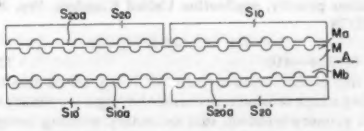
1. In an electric fence including an energizer transmitting a plurality of electric pulses having a predetermined animal deterring value along said fence, a monitoring system comprising at least one responder connected to said fence at a chosen point along its length for receiving said pulses and measuring a predetermined parameter thereof and being activated to transmit a return signal along said fence to a receiver, located at a location on the fence different than the location of the responder, on each occasion said responder receives at least one said electric pulse having said predetermined parameter of a predetermined value indicative of the effectiveness of the fence in deterring animals, said receiver including means for determining the time delay between the return signals from said responder and for providing an alarm indication if the time delay exceeds a value indicative that the effectiveness of the fence has fallen below a predetermined minimum.

4,297,634

DEVICE FOR MEASURING THE AMOUNT OF MOVEMENT OF A STRAIGHTLY MOVING OBJECT

Hiroomi Ogasawara, 3821-4, and Masaomi Ogasawara, 3833, both of Yamakita, Yamakitamachi, Ashigarakami-Gun, Kanagawa-Ken, Japan

Filed Nov. 30, 1979, Ser. No. 99,154
Claims priority, application Japan, Dec. 4, 1978, 53-149837
Int. Cl.[3] G01R *27/26*
U.S. Cl. 324—61 R 6 Claims



1. A device for measuring the amount of movement of a straightly moving object comprising:

(a) sensor means including (i) an elongated electrode member having gear-like graduations cut on two longitudinal outer walls thereof, (ii) a first pair of electrode plate members having gear-like graduations confronting respectively the graduations on said two longitudinal walls of said elongated electrode member to form therewith a first pair of capacitors, the relation of the graduations on the confronting surface of a first one of said first pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member being shifted 180° in phase from the relation of the graduations on the confronting surface of the other one of said first pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member, and (iii) a second pair of electrode plate members having gear-like graduations confronting respectively the graduations on said two longitudinal walls of said elongated electrode member to form therewith a second pair of capacitors, the relation of the graduations on the confronting surface of a first one of said second pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member being the same as the relation of the graduations on the confronting surface of the first one of said first pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member and being shifted 180° in phase from the relation of the graduations on the confronting surface of the other one of said second pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member;

one of (i) said elongated electrode member and (ii) said first and second pairs of electrode plate members being adapted to move longitudinally in response to longitudinal movement of the straightly moving object while the other one thereof is stationary, so that the capacitance of a first capacitor of each of said pairs of capacitors increases and the capacitance of the othercapacitor of each of said pairs of capacitors correspondingly decreases differentially as said straightly moving object moves longitudinally;

(b) two oscillator circuits, one oscillator circuit having said first one of said first pair of capacitors and said first one of said second pair of capacitors incorporated therein as frequency varying components, the other oscillator circuit having said second one of said first pair of capacitors and said second one of said second pair of capacitors incorporated therein as frequency varying components; and

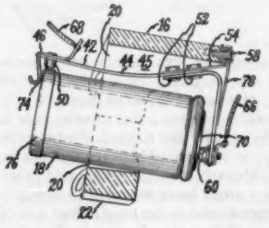
(c) mixer means connected to said two oscillator circuits for providing a frequency difference signal determined by the difference in the frequencies of said two oscillator circuits and indicative of the extent of longitudinal movement of the straightly moving object.

4,297,635

WATTHOUR METER AND BATTERY RETAINING APPARATUS THEREFOR

Francis J. Stevens, North Berwick, Me., assignor to General Electric Company, Somersworth, N.H.

Filed Nov. 19, 1979, Ser. No. 95,163
Int. Cl.[3] G01R *1/04, 11/04;* H01R *13/48;* H01M *2/10*
U.S. Cl. 324—156 17 Claims



1. Apparatus for retaining a replaceable battery comprising:

(a) a unitary structure characterized by a rigid material having first and second oppositely disposed ends and including therein a chamber longitudinally extending between the oppositely disposed ends, said chamber having an opening in at least one of the ends and having a wall

for surroundingly supporting a battery to be inserted into the chamber from the open end;

(b) a retaining means for retaining said battery in the chamber of said unitary structure, said retaining means characterized by an elongated member of resilient spring material, said elongated member having a lip formed on each end thereof, each lip extending substantially perpendicularly in the same direction from said elongated member and at a predetermined angle with respect thereto; and

(c) means, including said retaining means and said unitary structure, for mounting said retaining means on said unitary structure with a first lip of said retaining means disposed in the chamber at the first end of said unitary structure and a second lip of said retaining means disposed in the chamber at the second end of said unitary structure, one of the lips of said retaining means providing sufficient clearance in the chamber opening to allow said battery to be inserted into the chamber, whereby, when said battery is being inserted into the chamber, one of the first and second lips contacts one terminal end of said battery, while the other lip slidingly engages the outside surface of said battery creating concurrent and opposing forces at opposite ends of said elongated member causing said elongated member to bend and to thereby cause said other lip to slide off of the outside surface of said battery and snap over the other terminal end of said battery, when said battery is fully inserted into the chamber, to thus securely retain said battery in the chamber of said structure.

4,297,636

MAGNET AND PROBE MOUNTING MEANS ON A ROTATING HEAD OF MAGNETIC DEFECT TESTING APPARATUS

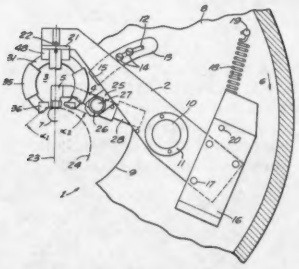
Hans Link, Reutlingen, and Ulrich Dreher, Trochtelfingen, both of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Förster Prüfgerätebau, Reutlingen, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,708

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838388

Int. Cl.³ G01R *33/00*; G01N *27/82*

U.S. Cl. 324—262 **18 Claims**



1. A rotating head for magnetic defect testing of elongated cylindrical ferromagnetic test articles in which a rearwardly closed magnet yoke rotates about the test articles, a winding on said yoke excites magnetic flux therein, pole faces of the said magnet yoke are directed towards the test article surface, and a probe support is arranged between the pole faces including at least one field-responsive test probe, said probe support being fastened to a probe lever mounted to swing in a plane transversely perpendicular to the longitudinal axis of the test article and having a sliding shoe bearing resiliently against the test article surface, the improvement comprising:

a yoke lever mounted on the rotating head for swinging movement in a plane transversely perpendicular to the longitudinal axis of the test article, said yoke lever having one end interconnected with the magnet yoke and an end opposite said magnet yoke carrying a counterweight; and said probe lever being rotatively mounted on the yoke lever.

4,297,637

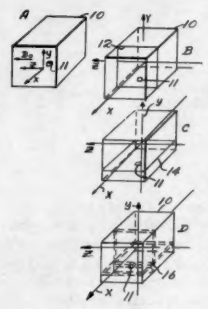
METHOD AND APPARATUS FOR MAPPING LINES OF NUCLEAR DENSITY WITHIN AN OBJECT USING NUCLEAR MAGNETIC RESONANCE

Lawrence E. Crooks, Richmond; John C. Hoenninger, III, Berkeley, and Mitsuaki Arakawa, Forest City, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 20, 1978, Ser. No. 926,571

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—309 **35 Claims**



1. A method for determining the relative densities of nuclei within an object, said nuclei having nuclear spins at Larmor frequencies in accordance with the intensity of a magnetic field operating thereon, the method comprising the steps of:

selectively effecting the generation of spin echo signals by nuclei disposed within a predetermined volume of said object by exciting intersecting regions in said object, said predetermined volume being defined by the intersection of said regions; and

detecting the intensity of said spin echo signals to obtain a measure of the relative density of nuclei in said predetermined volume.

4,297,638

X-RAY SYSTEM SIGNAL DERIVATION CIRCUITS FOR HEAT UNIT INDICATORS AND/OR CALIBRATION METERS

Robert R. LaFrance, St. Malo, Manitoba, Canada

Continuation-in-part of Ser. No. 914,504, Jun. 12, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,252

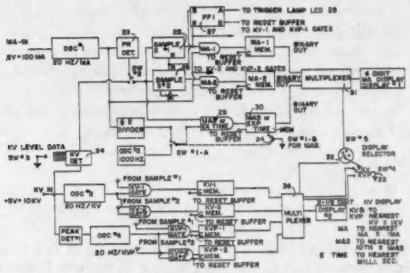
Claims priority, application United Kingdom, Sep. 15, 1978, 36982/78

Int. Cl.³ G01R *31/024*

U.S. Cl. 324—410 **12 Claims**

1. Signal derivation circuits for X-ray tubes, said tubes including a high tension transformer having a secondary winding and a primary winding, said secondary winding being operatively connected to the X-ray tube, said signal derivation circuits comprising in combination a milliampere circuit operatively connected to the mid point of the secondary winding of the high tension transformer thereby providing a signal that is proportional to the milliamperes flowing through said mid point of the secondary winding, a kilovolt circuit operatively connected to the primary voltage on the high tension transformer thereby providing, in conjunction with a load compensation signal derived from said milliampere circuit, a signal proportional to the kilovoltage across the X-ray tube and a multiplier circuit operatively connected to said milliampere circuit and said kilovolt circuit, and a heat unit indicating module operatively connected to said multiplier, said heat unit

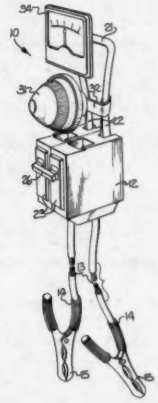
indicator module including a memory unit operatively connected to said multiplier circuit, and read-out means operatively connected to said memory unit, and a source of power for said circuit.



4,297,639
BATTERY TESTING APPARATUS WITH OVERLOAD PROTECTIVE MEANS

Tillman W. Branham, Rte. 1, Box 149, Lugoff, S.C. 29078

Continuation-in-part of Ser. No. 969,066, Dec. 13, 1978, abandoned. This application Jul. 18, 1979, Ser. No. 58,687
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—429 **11 Claims**



1. A battery testing apparatus for evaluating the charge capacity of a storage battery under no-load and load conditions while limiting the duration of the test and protecting both the testing apparatus and battery from excessive and potentially harmful current being drawn from the battery during the test, and comprising

cable means adapted to be connected to the electrodes of the storage battery,

voltage indicator means electrically connected to said cable means and operable for detecting the voltage available between the electrodes of the battery,

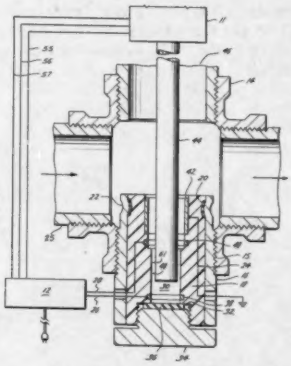
a load circuit including a load resistor connected in parallel with said voltage indicator means and switch means connected in series with said load resistor and positionable between open and closed states so that the relative magnitude of the voltage of the battery under a no-load condition can be determined when said switch means is open and the relative magnitude of the voltage of the battery under a load condition can be determined when said switch means is closed,

and said switch means comprising current responsive means which will open in response to the passage of current of a magnitude exceeding a predetermined amperage rating, the predetermined amperage rating of said current responsive means being correlated to the resistance of said load resistor and to a predetermined acceptable level of battery capability such that a battery undergoing testing and having a capability at or above said predetermined acceptable level will result in a current in the load circuit exceeding said predetermined amperage rating of the current responsive means, thereby opening said load circuit and protecting the battery and the testing apparatus from excessive current.

4,297,640
APPARATUS FOR MEASURING THE ELECTRIC CHARGE CONDITION OF NON-CONDUCTIVE PARTICLES IN A MILDLY CONDUCTIVE ELECTROLYTE

Zack J. Moore, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 11, 1980, Ser. No. 120,405
Int. Cl.³ G01R *5/28*
U.S. Cl. 324—458 **3 Claims**



1. In an apparatus for determining a function of the electrical charge condition in a flowable liquid media containing electrical charge influencing species, said apparatus having: (a) a substantially vertical tubular flowpath member which has walls which are electrically insulating, which tubular flowpath has an open end at its top and a closed end at its bottom, which closed end is also electrically insulating, and which tubular flowpath is disposed so that it may be substantially filled with said flowable liquid media; (b) a block-like reciprocating element whose outer wall, at least, is electrically insulating and which is disposed in slidable relationship within said flowpath member, said reciprocating element having a transverse cross-section such that it fits adjacent to but spaced from said walls of said flowpath member when it reciprocates in said flowpath member; (c) a pair of spaced sensing electrodes located within said flowpath member, the electrodes being made of the same metal, the first of said sensing electrodes being at least near the closed end of said flowpath member and the second of said sensing electrodes being spaced above the first sensing electrode nearer the open end of said flowpath member with both electrodes so disposed as to be contacted by said flowable liquid media entering or leaving said flowpath member; (d) means for reciprocating said reciprocating element in said flowpath member; (e) means for admitting of said flowable liquid media to said flowpath member; and (f) means coupled to said first and second electrodes to detect and amplify any

alternating component of any electrical current flowing betweeen said first and second spaced sensing electrodes; the improvement which comprises:

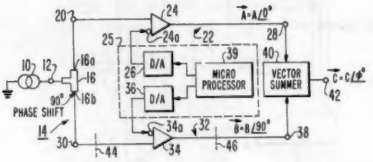
a guard electrode located inside said tubular flowpath spaced above said second sensing electrode, said second sensing electrode being located below the guard electrode which itself is located at or near the top of said tubular flowpath and above the first sensing electrode which itself is located at or near the bottom of said tubular flowpath with all three electrodes spaced from one another, said guard electrode circling the interior insulating wall of said tubular flowpath means but spaced sufficiently from the block-like reciprocating element to allow free flow of said flowable liquid medium between said guard electrode and said block-like reciprocating element, said guard electrode being electrically grounded and made of the metal as are the said two sensing electrodes, and said guard electrode having a surface and body large enough with respect to the surfaces and bodies of the two sensing electrodes so that its electrical resistivity is negligible with respect to the electrical resistivities of the sensing electrodes in order to shield the sensing electrodes from any galvanic cell-type electrical current which wouold flow through said flowable liquid media between these sensing electrodes and any external metals different in composition from the sensing electrodes in contact with the flowable liquid.

4,297,641

SERRODYNING SYSTEM EMPLOYING AN ADJUSTABLE PHASE SHIFTING CIRCUIT

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 80,103
Int. Cl.³ H03B *19/00*
U.S. Cl. 328—15 **1 Claim**



1. A phase shifting circuit for producing an output signal adjustably shifted in phase relative to an input alternating frequency signal, comprising in combination:

a first signal path having an input terminal receptive of said input signal and having a first output terminal, said first signal path comprising a first adjustable level signal translating device including a first level control terminal, said device being positioned intermediate said input terminal and output terminal;

a second signal path having an input terminal receptive of said input signal and having a second output terminal, said second signal path comprising a second adjustable level signal translating device including a second level control terminal;

means for effecting a 90° relative phase shift in one signal path relating to the other;

means coupled to said first and second output terminals for producing said output signal which is the vector sum of the signals appearing at said first and second output terminals;

means coupled to said first and second control terminals for respectively applying control signals thereto for controlling the level of signal produced respectively at said first and second output terminals for controlling the phase of said output signal by any amount between 0° and 90° relative to said input signal;

means for selectively shifting said output signal by N·90° where N=0, 1, 2, or 3 for thereby effecting a 0° to 360° phase shift relative to said input signal; and

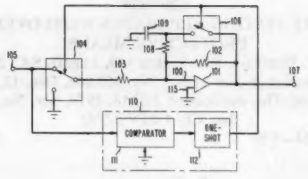
means for providing to said phase shifting circuit a signal at a given frequency f_1, means for continuously and uniformly shifting the phase of said signal in said phase shifting circuit between 0° and 360° and means responsive to said output signal from said phase shifting circuit for producing a signal at frequency f_2 where f_2 differs from f_1 by an amount determined by the rate at which said phase shift occurs in said phase shifting circuit.

4,297,642

OFFSET CORRECTION IN OPERATIONAL AMPLIFIERS

Gary L. Baldwin, Palo Alto, and James L. McCreary, Los Gatos, both of Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1979, Ser. No. 89,851
Int. Cl.³ H03F *1/00*
U.S. Cl. 330—9 **8 Claims**



1. Apparatus including an operational amplifier **(101)** which is adapted to receive an input signal, said apparatus comprising:

means **(104, 106)** connected with the output of said operational amplifier and operable to cancel d.c. offset in said amplifier,

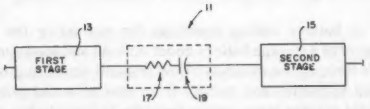
CHARACTERIZED BY means **(110)** for operating said cancelling means in response to zero crossings in said input signal.

4,297,643

NOISE OBVIATING ELECTRONIC SIGNAL COUPLING MEANS

Thomas J. Pearson, Jr., Rte. 1, Box 18, Coffeeville, Ala. 36524

Filed Nov. 13, 1979, Ser. No. 93,541
Int. Cl.³ H03F *1/00*
U.S. Cl. 330—178 **2 Claims**



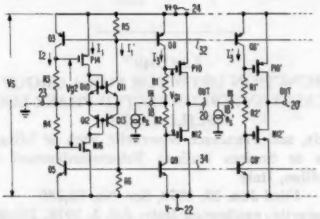
1. An improved coupling means for transferring an electronic signal from the output of any stage of gain to the input of the succeeding stage for obviating the noises as the signal is transferred, said coupling means including a circuit means for extending between the output of the stage of gain and the input of the succeeding stage and capacitor electrically mounted in the circuit means, wherein the improvement comprises: a resistor electrically mounted in the circuit means between the output of the stage of gain and the capacitor with no other electrical components or connections being placed between said resistor and the capacitor, said resistor being in series with the capacitor.

4,297,644

AMPLIFIER WITH CROSS-OVER CURRENT CONTROL

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 23, 1979, Ser. No. 96,739
Int. Cl.³ H03F 3/30
U.S. Cl. 330—264 **9 Claims**



1. A complementary symmetry amplifier comprising:

first, second, third, and fourth field-effect transistors, each having respective source and drain electrodes defining the ends of its conduction channel and each having a gate electrode, said first and third transistors being of P-channel type and said second and fourth transistors being of N-channel type;

means for applying an operating potential between the source electrodes of said first and second transistors;

input and output terminals;

respective means for connecting the drain electrodes of said first and second transistors to said output terminal;

means for connecting the gate electrode of said first transistor to said input terminal;

means for connecting the gate electrode of said second transistor to said input terminal;

means for regulating the current flows through the conduction channels of said third and fourth transistors to a prescribed value substantially independent of said operating potential; and

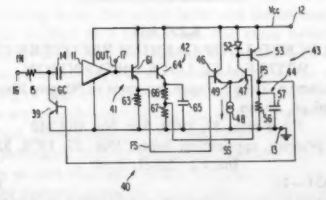
means responsive to the resulting gate-to-source voltages of said third and fourth transistors for applying respective potentials proportional to said resulting gate-to-source voltages as the respective gate-to-source voltages of said first and second transistors.

4,297,645

AUTOMATIC GAIN CONTROL CIRCUIT COMPRISING A CIRCUIT FOR COMPARING A MODULATED SIGNAL WITH AN ENVELOPE DETECTED SIGNAL

Kouichi Tanaka, Tokyo, and Kiyoshi Amazawa, Ohmiya, both of Japan, assignors to Nippon Electric Co., Ltd. and Clarion Co., Ltd., both of Tokyo, Japan

Filed Sep. 20, 1979, Ser. No. 77,222
Int. Cl.³ H03G 3/30
U.S. Cl. 330—280 **5 Claims**



1. An automatic gain control circuit to be coupled to an amplifier having a controllable gain and responsive to an input signal and a gain control signal for amplifying said input signal with the gain automatically controlled in compliance with said gain control signal to produce an amplified signal, said automatic gain control circuit being responsive to said amplified signal for producing said gain control signal, wherein the improvement comprises:

first means having a first reference level and responsive to said amplified signal for superposing said amplified signal on said first reference level to produce a first signal of a first level variable in compliance with said amplified signal;

second means having a second reference level and responsive to said amplified signal for carrying out envelope detection of said amplified signal to produce a second signal of a second level variable in response to said amplified signal with said second variable level offset by said second reference level so that said second variable level traverses said first variable level during discrete intervals of time;

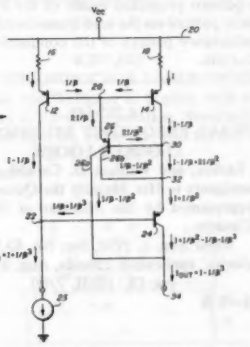
third means for comparing said first signal with said second signal to produce a pulse signal during said discrete intervals; and fourth means for smoothing said pulse signal to produce said gain control signal.

4,297,646

CURRENT MIRROR CIRCUIT

James J. LoCascio, Mesa, and Robert B. Jarrett, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 25, 1980, Ser. No. 115,522
Int. Cl.³ H03F 3/14
U.S. Cl. 330—288 **10 Claims**



1. A current mirror, comprising:

current turn around means for supplying first, second and third currents at respective outputs, said current turn around means being coupled to a terminal which is adapted to receive an operating potential;

current source means coupled to a first one of said outputs of said current turn around means for supplying an input current thereto;

output electron control means having a first, a second and a control electrode, said first electrode being connected to a second one of said outputs of said current turn around means, said second electrode being coupled to an output terminal of the current mirror, said control electrode being coupled to said current source means; and

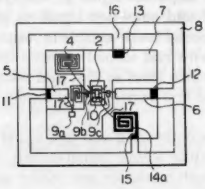
first electron control means having first, second, third and control electrodes, said first electrode being coupled to a third one of said outputs of said current turn around means, said second electrode being coupled to said output terminal of the current mirror, and said third and control electrodes each being coupled to said first electrode of said output electron control means.

4,297,647

HYBRID INTEGRATED CIRCUIT AND A METHOD FOR PRODUCING THE SAME

Masahiro Akiyama; Katuzo Kaminishi, and Yasushi Kawakami, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1979, Ser. No. 48,849
Claims priority, application Japan, Jun. 16, 1978, 53/81657[U]
Int. Cl.³ H03F 3/14; H05K 5/02
U.S. Cl. 330—307 9 Claims



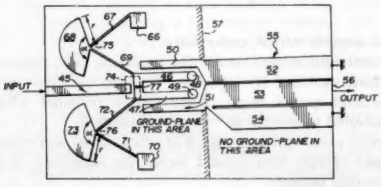
6. A hybrid integrated circuit comprising of a ceramic substrate, a conductive pattern attached on the ceramic substrate for providing electronic components including an inductor and a connection terminal, a lead frame having a closed frame and being connected to said conductive pattern; gold layer plated on said conductive pattern and the lead frame; electronic components mounted on said conductive pattern; and said electronic components and said conductive pattern being wired with one another, characterized in that the lead frame has an inductance pattern projected inside of the closed frame, and the inductance pattern on the lead frame overlaps on the corresponding inductance pattern of the conductive pattern on the ceramic substrate.

4,297,648

MICROWAVE FREQUENCY DIVISION BY PHASE LOCKED LOOPS

Trevor W. Tucker, and William D. Cornish, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Aug. 3, 1979, Ser. No. 63,171
Claims priority, application Canada, Aug. 31, 1978, 310452
Int. Cl.³ H03L 7/00
U.S. Cl. 331—1 R 2 Claims



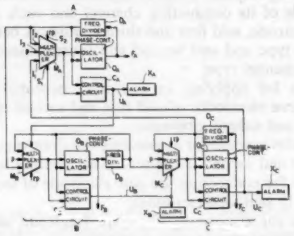
1. Apparatus for producing a stable microwave frequency signal comprising an rf oscillator for supplying microwave signals of frequency f_1 above 2 GHz to an output terminal of the apparatus and to an input of a microwave analog frequency divider, said frequency divider dividing said microwave signals by N, where N is an integer, and a phase detector having one input connected to receive the output of said frequency divider, said phase detector having another input fed by a reference oscillator of frequency f_2, wherein $f_2=f_1/N$, said phase detector having an output connected to a control input of said rf oscillator whereby the output frequency of said rf oscillator is adjustable to equal Nf_2, said frequency divider comprising resonant circuit means, comprising at least two microwave transmission lines and a corresponding number of non-linear reactance elements, for receiving said microwave signal and for providing a balanced output signal of a frequency 1/N times the input signal, said microwave transmission lines comprising terminated microstrip transmission lines and said non-linear reactance elements comprising varactor diodes located at the terminated ends of the microstrip transmission lines, said frequency divider further comprising a balun electromagnetically coupled to said microstrip transmission lines.

4,297,649

MALFUNCTION DETECTOR FOR A GROUP OF CYCLICALLY INTERCONNECTED PHASE-LOCKED OSCILLATORS

Anes Sbuelz, and Francesco Marchelli, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jun. 29, 1979, Ser. No. 53,280
Claims priority, application Italy, Jul. 3, 1978, 25268 A/78
Int. Cl.³ H03L 7/00
U.S. Cl. 331—2 5 Claims



1. A circuit arrangement for generating a multiplicity of oscillations locked in phase with one another, comprising a multiplicity of cyclically interconnected generator stages each comprising:

a phase-controlled oscillator with a synchronizing input and with a feedback loop between an output and another input thereof;

a multiplexer with a first input connected to the output of the oscillator of the immediately preceding stage, a second input connected to said feedback loop and an output connected to said synchronizing input; and

a control circuit with inputs connected in parallel with those of said oscillator to said feedback loop and to the output of said multiplexer, respectively, said control circuit being responsive to a disparity between the frequencies of feedback and synchronizing oscillations appearing on its said inputs for switching only the multiplexer of the immediately succeeding stage to said second input thereof with concurrent emission of an alarm signal indicative of a malfunction of the associated oscillator.

4,297,650

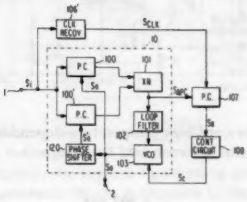
PHASE LOCKED LOOP CARRIER RECOVERY CIRCUIT WITH FALSE LOCK PREVENTION

Saburo Shinmyo, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 108,249
Claims priority, application Japan, Dec. 27, 1978, 53-164883
Int. Cl.³ H03L 7/10
U.S. Cl. 331—11 6 Claims

1. A carrier recovery apparatus comprising an input terminal for receiving a phase-modulated carrier, a voltage-controlled oscillator for generating a variable frequency oscillation in response to a control signal, a first phase comparator for pro-

viding a comparison output representative of the phase difference between said modulated carrier and the output of said voltage-controlled oscillator, a loop filter for supplying said voltage-controlled oscillator with the low-frequency component of the output of said first phase comparator as said control signal, a clock recovery circuit for generating a clock signal in



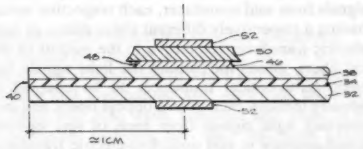
response to said modulated carrier, a second phase comparator for providing a comparison output representative of the phase difference between the output of said first phase comparator and said clock signal, and means for superimposing the low-frequency component of the output of said second phase comparator on one of the outputs of said first phase comparator and said loop filter.

4,297,651

METHODS FOR SIMULTANEOUS SUPPRESSION OF LASER PULSATIONS AND CONTINUOUS MONITORING OF OUTPUT POWER

John C. Dyment, Kanata, and Kiuchi D. Chik, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 23, 1979, Ser. No. 68,887
Int. Cl.³ H01S 3/19
U.S. Cl. 331—94.5 H **6 Claims**



1. A semiconductor laser device adapted for suppression of transient relaxation oscillations and sustained spontaneous pulsations, the device comprising:

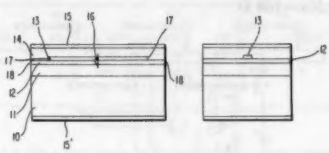
A semiconductor ship having a substrate, a first confining layer, a waveguide layer, an active layer and a second confining layer, the active layer and the second confining layer formed as a laser mesa, the mesa having a metal contact thereon, a corresponding surface area of the substrate also having a metal contact thereon, the waveguide being of higher refractive index than an underlying layer, the waveguide layer having one end of non-linear configuration, the waveguide being longer at a central region than at peripheral regions at said one end, and tapering gradually to zero thickness at said one end whereby collimated light directed along the waveguide towards said one end is reflected back therefrom and is returned to the laser active layer, such reflection occurring between 0.3 and 2 centimeters from the laser active layer.

4,297,652

INJECTION-TYPE SEMICONDUCTOR LASER

Izuo Hayashi, and Hiroo Yonezu, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 83,043
Claims priority, application Japan, Oct. 11, 1978, 53-125585
Int. Cl.³ H01S 3/19
U.S. Cl. 331—94.5 H **10 Claims**



1. In a semiconductor laser having a multi-layer structure formed on a substrate and two opposing cleaved surfaces, said semiconductor laser comprising:

a first semiconductor layer for guiding a laser beam;

an active layer disposed in contact with said first semiconductor layer, said active layer being formed in the shape of a stripe, said stripe having substantially planar ends which are spaced from said cleaved surfaces;

a third semiconductor layer burying said active stripe;

a first electrode for supplying a first electric potential through said third semiconductor layer; and

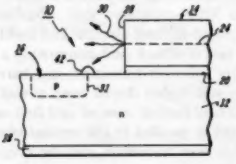
a second electrode formed on said substrate for supplying a second electric potential thereto.

4,297,653

HYBRID SEMICONDUCTOR LASER/DETECTORS

Donald R. Scifres, and Wolfgang E. Stutius, both of Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1979, Ser. No. 34,238
Int. Cl.³ H01S 3/19
U.S. Cl. 331—94.5 S **10 Claims**



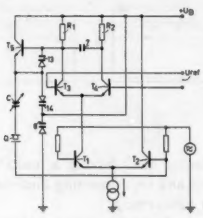
1. A hybrid semiconductor laser/detector on a single semiconductor substrate, said laser having front and rear light emitting facets and being mounted on the surface of said substrate, an optical detector integral to said substrate, said detector being adjacent to one of said light emitting facets to detect a small portion of the light emitted therefrom, a bias circuit connected to supply an operating current to said laser, said detector being connected to said bias circuit to provide a feedback signal proportional to the detected light from said one facet to adjust and maintain said operating current to provide a predetermined optical power output level and means formed on said substrate to enhance the light collecting efficiency of said detector, said laser mounted on a metalized region formed on said substrate surface, the elevation of said mounted laser being below said detector, a portion of said metalized region extending on said substrate surface beyond said mounted laser, said extended portion acting as a reflector and constituting said substrate formed means.

4,297,654

CRYSTAL OSCILLATOR INCLUDING A MOS-CAPACITOR

Joachim Goerth, Lüneburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 929,442, Jul. 31, 1978, Pat. No. 4,214,252.
This application Jan. 10, 1980, Ser. No. 111,136
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735529; Jun. 15, 1978, 2826192
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—108 D **4 Claims**



1. A semiconductor device comprising a semiconductor substrate of first conductivity type; a semiconductor layer of second conductivity type overlying said semiconductor substrate; an insulating layer on said semiconductor layer; a conductive layer formed on said insulating layer; a highly doped zone of said second conductivity type formed in the surface of said semiconductor layer; said highly doped zone, said insulating layer, and said conductive layer formaing a MOS-capacitor; a further zone of said first conductivity type entirely surrounding said highly doped zone and interposed between said highly doped zone and said semiconductor layer; and a separate connection electrode at each of said highly doped zone, said further zone, and said semiconductor layer; an emitter follower transistor being connected in parallel to the barrier layer capacitance between said highly doped zone and said further zone; and said device further comprising a tunable oscillator including a differential amplifier, a current distributor controlled by a control voltage and being disposed in a branch of said differential amplifier, a phase shifting element including said MOS-capacitor, and a feedback path present between said phase-shifting element and input to said differential amplifier, said feedback path comprising a quartz oscillator and said emitter follower transistor, said barrier layer capacitance between said highly doped zone of said second conductivity type and said further zone of said first conductivity type being connected in parallel to the emitterbase current path of said emitter follower transistor, and the connection point between additional barrier layer capacitances of said device being connected to a supply voltage.

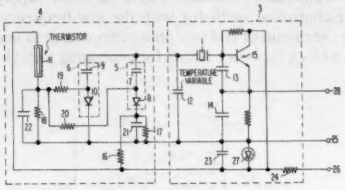
4,297,655

TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

Shuzo Fujii, and Yoshikatsu Sato, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1979, Ser. No. 84,693
Claims priority, application Japan, Oct. 20, 1978, 53-129260; Dec. 15, 1978, 53-156128
Int. Cl.³ H03B *5/04, 5/36*
U.S. Cl. 331—116 R **6 Claims**

1. In a temperature compensated crystal oscillator comprising an oscillator section having a crystal resonator and an amplifying element, and a temperature compensating section for compensating for a change in the oscillator frequency due to a temperature change of said oscillator section, the improvement wherein said temperature compensating section comprises: a low temperature compensating circuit comprising a series circuit including a fixed capacitor connected in series with said crystal resonator and a diode, and a thermistor for



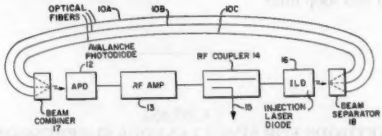
applying a forward-bias temperature-dependent voltage to a connection point between said fixed capacitor and said diode.

4,297,656

PLURAL FREQUENCY OSCILLATOR EMPLOYING MULTIPLE FIBER-OPTIC DELAY LINE

Jing-Jong Pan, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 23, 1979, Ser. No. 23,394
Int. Cl.³ H03B *5/00, 17/00*
U.S. Cl. 331—135 **7 Claims**



6. An oscillator comprising:
a gain producing element having an input and an output;
a plurality of feedback paths connected between said input and said output of said gain producing element; and
frequency determining means within said feedback paths comprising an electrical-to-optical transducer producing a light signal in response to the output of the gain producing element, a plurality of optical fibers responsive to light signals from said transducer, each respective optical fiber having a respectively different phase delay, an optical-to-electric transducer responsive to the outputs of said optical fibers, means for causing the light signals from said electrical-to-optical transducer to be coupled simultaneously through each of said optical fibers, and means for coupling light signals from each of said optical fibers simultaneously to said optical-to-electric transducer.

4,297,657

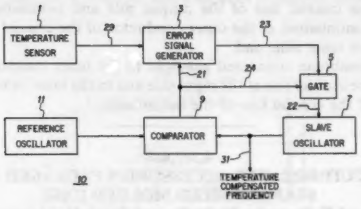
CLOSED LOOP TEMPERATURE COMPENSATED FREQUENCY REFERENCE

Marvin E. Frerking, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 29, 1979, Ser. No. 88,908
Int. Cl.³ H03L *1/02*
U.S. Cl. 331—176 **6 Claims**

1. A closed loop temperature compensated frequency reference, comprising:
controllable oscillator means for generating a first frequency;
reference oscillator means for generating a second frequency;
comparator means for comparing the first frequency means with the second frequency means to obtain a composite signal;
sensor means for measuring the temperature of the reference oscillator means and to provide a temperature signal representative of the measured temperature; and

error signal generator means for generating a control signal to control the controllable oscillator means and the first



frequency thereby, the control signal being generated by error signal generator means in response to the composite signal and the temperature signal.

4,297,658

3DB WAVEGUIDE DIRECTIONAL COUPLER

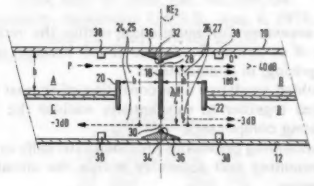
Leo Treczka, Munich, Fed. Rep. of Germany, assignor to Spinner GmbH Elektrotechnische Fabrik, Munich, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,472

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2904054

Int. Cl.³ H01P *5/18*

U.S. Cl. 333—113 **11 Claims**



1. A 3dB waveguide directional coupler, comprising:

first and second rectangular waveguides, each of which has a longitudinal axis and each of which extends parallel to its respective said longitudinal axis; each said wave guide comprising four side walls, said four side walls of each said waveguide including two vide side walls having a first width and two narrow side walls having a second width less than said first width; one said wide side wall of said first waveguide and one said wide side wall of said second waveguide being adjacent each other;

said adjacent wide side walls each having an aperture formed therein such that the interiors of said waveguides communicate through said aperture; and

means disposed in said waveguides and cooperating with said aperture in such a manner that when energy is input from one end of said first waveguide in a direction along said first axis and toward said aperture, substantially all of said input energy is transmitted to said second waveguide via said aperture and is propagated along said second axis, substantially equal amounts of said transmitted energy being propagated along said second axis in a first longitudinal direction and along said second axis in a second longitudinal direction opposite said first longitudinal direction, the energy in each of the longitudinal directions along said second axis being substantially greater than any energy along said first axis propagating away from said aperture.

4,297,659

CRYSTAL FILTER STRUCTURE

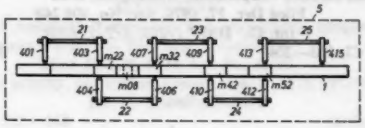
Horst G. Augst, Skärholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 10, 1979, Ser. No. 102,032

Claims priority, application Sweden, Dec. 20, 1978, 7813107

Int. Cl.³ H03H *9/50, 9/56, 9/58, 9/60*

U.S. Cl. 333—191 **6 Claims**



5. A crystal filter structure of the polylithic type comprising an elongated planar support means, first, second and third quartz plates, each including two acoustically coupled resonators, each resonator being defined by first and second electrodes on the first and second sides, respectively of a portion of a quartz plate, means for mounting said first and third resonators on one side of said planar support means, means for mounting said second resonator on the other side of said planar support means axially intermediate said first and second resonators, the first electrode of the first resonator of the first quartz plate being adapted to receive a signal, means for connecting the first electrode of the second resonator of said first quartz plate to the first electrode of the first resonator of said second quartz plate, and means for connecting the first electrode of the second resonator of said second quartz plate to the first electrode of the first resonator of said third quartz plate, and said first electrode of the second resonator of said third quartz plate being adapted to transmit a signal.

4,297,660

ELECTRIC CIRCUIT USING SURFACE ACOUSTIC WAVE DEVICE

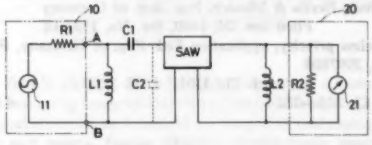
Hideharu Ieki, Nagaokakyo, and Seiichi Arai, Muko, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 7, 1979, Ser. No. 101,279

Claims priority, application Japan, Dec. 14, 1978, 53-173215[U]; Dec. 26, 1978, 53-182526[U]

Int. Cl.³ H03H *9/64, 9/42*

U.S. Cl. 333—194 **7 Claims**



1. An electric circuit including a surface acoustic wave device, comprising:

a surface acoustic wave device including an input transducer and an output transducer formed on a piezoelectric substrate, each of said transducers having a respective pair of terminals, and the impedance of each of said transducers as measured across said respective pair of terminals having a respective resistive component and a respective capacitive component; and

impedance conversion circuit means, including first capacitor means having one end connected to one terminal of one of said pairs of terminals and inductor means having one end connected to a second end of said first capacitor means and having a second end connected to the other terminal of said one of said pairs of terminals, the value of said first capacitor means being such that the impedance

measured across said ends of said inductor means has a larger resistive component than said resistive component of said transducer impedance measured across said one of said pairs of terminals.

4,297,661

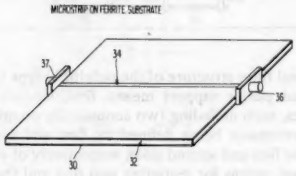
FERRITE SUBSTRATE MICROWAVE FILTER

Ronald E. Stegens, Brookeville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 27, 1979, Ser. No. 108,248

Int. Cl.³ H01P *1/203, 1/215, 3/08*

U.S. Cl. 333—204 **8 Claims**



1. A microwave filter comprising:

a pair of conductors;

a non-magnetized ferrite material located between said pair of conductors, said ferrite material having a saturation magnetization $4\pi M_s$ chosen to substantially absorb frequencies below a critical frequency f_{CRIT} such that

$$f_{CRIT} \approx 2.8 * 4\pi M_s$$

to produce a first filter characteristic, said ferrite material substantially absorbing frequencies below said critical frequency, wherein said first filter characteristic provides (i) high attenuation below said critical frequency, (ii) low attenuation above said critical frequency, and (iii) low reflected-to-incident power ratio above and below said critical frequency.

4,297,662

GAS-TIGHT-HIGH-FREQUENCY PERMEABLE WINDOW ARRANGEMENT IN A COAXIAL LINE, PARTICULARLY FOR TRAVELING WAVE TUBES

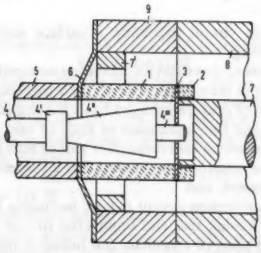
Franz Gross, Loerrach; Gerit Boehme, Germering; Wolf Wiehler, Neubiberg, and Wilhelm Bibracher, Otterloh, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 115,011

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907808

Int. Cl.³ H01P *1/08, 5/02*

U.S. Cl. 333—252 **4 Claims**



1. A gas-tight, high-frequency permeable window arrangement between a coaxial line on an input side and a coaxial line on an output side, each of the coaxial lines having respective inner and outer conductors, particularly for traveling wave tubes, comprising:

a ceramic hollow cylinder arranged between the input side and the output side, said cylinder surrounding the inner conductor of the input side in the area of its transition to the coaxial line of the output side and connected as a continuation of the outer conductor of the coaxial line of the input side; and

a membrane connected gas-tight to the inner conductor of the coaxial line at the input side and to the inner conductor of the coaxial line of the output side.

4,297,663

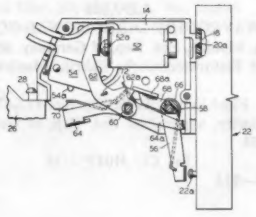
CIRCUIT BREAKER ACCESSORIES PACKAGED IN A STANDARDIZED MOLDED CASE

Raymond K. Seymour, Plainville, and Frank H. Murphy, West Hartford, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,714

Int. Cl.³ H01H *73/06, 73/08*

U.S. Cl. 335—20 **8 Claims**



1. An accessory for installation within the molded case enclosure of an automatic electric circuit breaker, said accessory comprising, in combination:

A. a molded insulative case consisting of at least two parts secured together to substantially enclose the accessory operating components;

B. first mounting provisions provided externally on said case for mounting said accessory within the circuit breaker enclosure;

C. second mounting provisions preformed in said case parts;

D. third mounting provisions preformed in said case parts;

E. at least one auxiliary swtich stationarily mounted by said second mounting provisions within said case; and

F. an actuating arm for said switch mounted within said case by said third mounting provisions for movement between said first and second positions, said arm protruding through an opening in said case into operative relation with the movable contacts of the circuit breaker, said arm being propelled between its first and second positions in response to movement of the breaker movable contacts between their open and closed circuit positions.

4,297,664

ELECTROMAGNETIC OVERCURRENT TRIPPING DEVICE WITH ADJUSTABLE ARMATURE AIR GAP

Manfred Küger; Wolfgang Nawrot, and Bernhard Preüss, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,511

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2815130

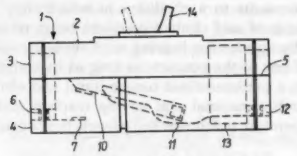
Int. Cl.³ H01H *69/01*

U.S. Cl. 335—176 **5 Claims**

1. In an electromagnetic overcurrent tripping device for electric circuit breakers having a stationary magnetic yoke with associated pole surfaces, an armature which is supported for motion relative to the pole surfaces, and means for chang-

ing the spacing between the pole surfaces and the armature to provide different tripping current levels, the improvement comprising:

the means for changing the spacing comprising a removable armature stop member and a support means for fixing the



position of the removable stop member relative to the pole surfaces,

the removable stop member being mounted on the support means in one of a number of predetermined positions to establish a corresponding spacing of the armature relative to the support means.

4,297,665

DOUGHNUT-TYPE TRANSFORMER FOR RESISTANCE BUTT WELDING

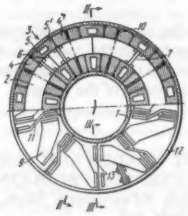
Boris E. Paton, ulitsa Chkalova, 41-a, kv. 26; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Vasily A. Sakharnov, ulitsa Solomenskaya, 41, kv. 93; Boris A. Galyan, ulitsa Lenina, 88/92, kv. 110, and Stanislav D. Dobrovolsky, ulitsa Zhukova, 22, kv. 7, all of Kiev, U.S.S.R.

Filed May 14, 1980, Ser. No. 149,734

Claims priority, application U.S.S.R., Aug. 6, 1979, 2789203

Int. Cl.³ H01F *27/08, 27/28*

U.S. Cl. 336—60 **3 Claims**



1. A doughnut-type transformer for resistance butt welding comprising:

an annular core,

an array of annularly disposed transformer sections, each including;

a primary winding composed of turns each of which shaped as a sector in the plane of the transformer cross-section, and

a cooled secondary winding composed of a turn shaped as a sector in the plane of the transformer cross-section, and placed between the turns of said primary winding so that the turns of said primary winding with their lateral sides are near the lateral sides of each turn of said secondary winding,

each turn of both said primary winding and said secondary winding of each said transformer section having an opening forming part of an annular space with said annular core extending therethrough so that the geometric center of each said winding is displaced from the geometric center of said annular core in the cross-sectional plane thereof, the geometric center of said annular core being farther from the transformer axis to level off current density per winding.

4,297,666

SLOW-BLOWING FUSE USING ZINC-MANGANESE ALLOY LINK

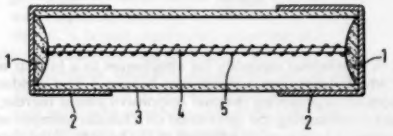
Nasrollah Asdollahi, Witten, Fed. Rep. of Germany, assignor to Wickmann Werke AG, Fed. Rep. of Germany

Filed Jan. 26, 1979, Ser. No. 6,779

Claims priority, application Austria, Feb. 3, 1978, 757/78

Int. Cl.³ H01H *85/06*

U.S. Cl. 337—163 **8 Claims**



1. A slow-blowing fuse having a fusible conductor and a carrier body, said fusible conductor comprising a wire wound on said carrier body and said wire consisting of a zinc-manganese alloy which contains 0.005% to 2% by weight of manganese.

4,297,667

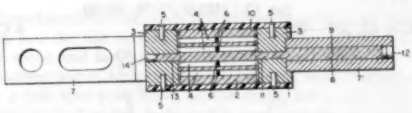
FUSIBLE ELECTRIC CABLE PROTECTOR

Frederick J. Kozacka, South Hampton, N.H., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 2, 1980, Ser. No. 136,629

Int. Cl.³ H01H *85/16*

U.S. Cl. 337—251 **3 Claims**



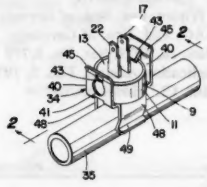
1. A fusible electric cable protector including a casing of electric insulating material defining a first internal space, a pair of terminal elements each located on one end of said casing and closing said casing, fusible elements co..ductively interconnecting said pair of terminal elements, a granular arc-quenching filler inside said first space, a pair of connector elements each conductively connected to one of said pair of terminal elements and each extending axially outwardly from one of said pair of terminal elements for connecting said cable protector into an electric circuit, at least one of said pair of connector elements having a cylindrical outer surface wherein the improvement comprises a second internal space defined by said one of said pair of connector elements having a cylindrical outer surface, said second internal space being filled with a granular arc-quenching filler, said second internal space and said first internal space communicating with each other by a passageway extending through one of said pair of terminal elements, and said one of said pair of connector elements having a cylindrical surface being closed at the axially outer end thereof to preclude loss of said granular arc-quenching filler.

4,297,668

THERMOSTAT WITH BRACKET FOR ATTACHMENT TO A TUBULAR MEMBER

Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Feb. 13, 1980, Ser. No. 121,138
Int. Cl.³ H01H *37/04*
U.S. Cl. 337—365 **10 Claims**



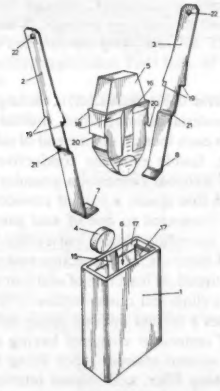
1. A thermostat assembly for attachment to a tubular member which comprises a thermostat having a heat-conductive bottom and containing thermal responsive means therein; and means for mounting the thermostat on a tubular member which comprises a base portion adjacent to the bottom of the thermostat and which is adapted to fit against and extend longitudinally along the tubular member and which has a longitudinal opening therein to permit the bottom of the thermostat to directly contact the tubular member, a pair of thermostat-retaining portions which extend from the base portion on either side of the thermostat and which have means for attaching to the thermostat, and a clip portion which extends from the base portion and which is adapted to extend around the tubular member to tightly attach the base portion to the tubular member.

4,297,669

THERMAL CUT-OUTS AND TO THE METHOD OF ASSEMBLING A MULTIPLICITY OF SUCH THERMAL CUT-OUTS

James A. Gale, Warminster, England, assignor to Kenneth E. Beswick Ltd., Somerset, England

Filed Aug. 27, 1979, Ser. No. 70,028
Claims priority, application United Kingdom, Mar. 8, 1978, 34926/78
Int. Cl.³ H01H *37/76, 69/00*
U.S. Cl. 337—407 **6 Claims**



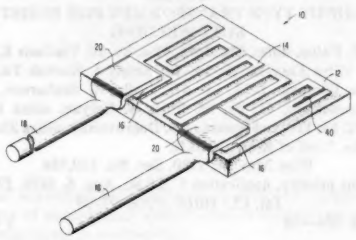
1. A thermal cut-out which is adapted to open an electrical circuit in response to an excessive rise in temperature associated with the circuit protected by said cut-out, said cut-out comprising a hollow body made from electrically insulating material and having an opening permitting access to the interior of the body, a pair of contact members projecting into the body through said opening and having their inner ends disposed within the body, one of said contact members being bent and hooked over an adjacent bent end portion of the other contact and in surface-to-surface contact therewith, a plug of insulating material being disposed within the opening in the body between said contacts, so as to close said opening and stress the contacts to a condition in which they are biased apart, surfaces of said contact members being retained in engagement by an element bearing with surface contact againt one side of one of the contacts as long as its temperature has not risen to a predetermined temperature, said element being made of such a material that having reached said predetermined temperature it deforms and permits the contacts to open.

4,297,670

METAL FOIL RESISTOR

Benjamin Solow, North Hollywood, Calif., assignor to Angstrohm Precision, Inc., Hagerstown, Md.

Division of Ser. No. 803,791, Jun. 3, 1977, Pat. No. 4,176,445.
This application May 24, 1979, Ser. No. 41,928
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—195 **15 Claims**



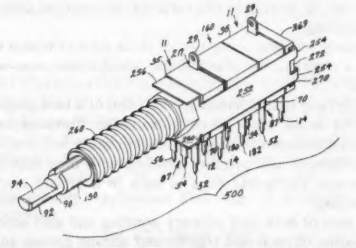
1. A resistor having an insulating substrate, and a metal foil circuit pattern attached to the substrate, wherein at least a portion of the metal foil circuit is reduced in thickness by acid etching to adjust the value of the resistor.

4,297,671

TANDEM INSERT MOLDED ELECTRICAL CONTROLS AND PROCESS FOR PRODUCING SAME

Thomas W. Flanders, Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.

Filed Jun. 11, 1980, Ser. No. 158,597
Int. Cl.³ H01C *10/50*
U.S. Cl. 338—200 **20 Claims**



1. A process for performing multiple electrical control functions, comprising the steps of aligning linearly at least three insert molded electrical control means within an impact construction, said construction comprising a front plate having side straps extending the cumulative length of said control

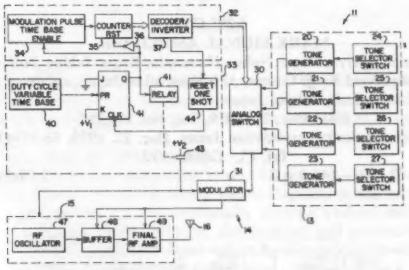
means to encompass them longitudinally and disposed exteriorly of said control means, each of said straps including finger ends, and a rear plate, mechanically securing the finger ends to the rear plate positioned against the endmost one of said aligned control means, said control means comprising a variable resistance control, a power control, and a momentary switch, each of which is insert molded and relatively changeable in their relative alignment within said construction, a hollow concentric insulator shaft for operation of said controls, and a longitudinal metallic shaft journaled within said concentric insulator shaft, and rotating the longitudinal metallic shaft which extends through the respective control means.

4,297,672

EARLY WARNING SYSTEM FOR APPROACHING TRANSPORTATION VEHICLES

Russell L. Fruchey, Copley, and Daniel E. Kupar, Barberton, both of Ohio, assignors to D.E.W. Line, Inc., Hiram, Ohio

Filed Feb. 4, 1980, Ser. No. 118,517
Int. Cl.³ G08G *1/12*
U.S. Cl. 340—23 **21 Claims**



1. A radio signaling system for providing advanced warning of an approaching transportation vehicle to passengers within a plurality of predesignated pickup regions, comprising:

transmitting system means on the vehicle for generating a low-frequency-modulated radio-frequency signal including

transmitter means for generating a radio-frequency signal,

a plurality of low-frequency generators for generating a plurality of low-frequency modulation signals, and,

modulator and control circuit means for modulating said radio-frequency signal with each said plurality of low-frequency modulation signals in a preselected sequence, including

analog switch means for receiving each of said plurality of low-frequency modulation signals and selectively gating the same to said transmitter means,

modulation-pulse time control means for generating an output signal to said analog switch means to control the sequence of and rate at which said low-frequency modulation signals are gated by said analog switch means and generating a cycle-complete output signal after all said plurality of low-frequency modulation signals have been gated to said transmitter means by said analog switch means, and

transmitter operation time control means for selectively gating power to said transmitter means and thereby controlling the duration said transmitter means generates said radio-frequency signal, and receiving said cycle-complete output signal and generating an output signal for controlling said modulation-pulse time control means, said output signal for controlling said modulation-pulse time control means disabling the same upon receipt of said cycle-complete output signal and subsequently enabling the operation of said modulation-pulse time control means in synchronization with said gating of power to said transmitter means; and,

receiving system means in proximity to a predesignated pickup region for providing an alarm signal only when the transportation vehicle is approaching the predesignated pickup region with which that particular receiving system means is associated including

receiver means receiving said low-frequency-modulated radio-frequency signal and providing a demodulated output signal,

a plurality of low-frequency decoders receiving said demodulated output signal each of which is tuned to the frequency of one of said plurality of low-frequency generators for providing an output signal upon receipt of that low-frequency signal,

synchronous detector means receiving said output signals from all said plurality of low-frequency decoders and providing an alarm output signal only upon receipt of said output signals from said plurality of low-frequency decoders in said preselected sequence, and,

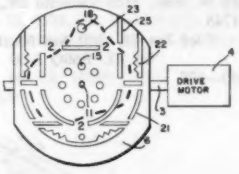
alarm means receiving said alarm output signal from said synchronous detector means and providing an advanced warning of the approaching vehicle to passengers within the predesignated pickup region with which said receiving system is associated.

4,297,673

OMNIDIRECTIONAL SPEED COCKPIT DISPLAY

David L. Green, Potomac, Md., assignor to Pacer Systems, Inc., Burlington, Mass.

Filed Mar. 14, 1978, Ser. No. 886,485
Int. Cl.³ B64D *45/00*; G08G *5/02*
U.S. Cl. 340—27 NA **28 Claims**



1. Omnidirectional speed cockpit display apparatus for helicopters and the like comprising a drum having markings of lateral speed and forward and rearward speed having shaft means connected to drive means for supporting and turning the drum, a first zero point mark on the drum, and a safe flight envelope marked on the drum, and at least partially surrounding said first zero point; a face plate with a second zero point mark, for indicating forward and rearward speed with the drum a lateral flight indicator means moving left or right of said second zero point as a means cooperating with lateral speed markings and the safe flight envelope for indicating lateral speed and safety of lateral speed.

4,297,674

PASSIVE SECURITY DEVICE

Richard C. Merten, Omaha, Nebr., assignor to Jubilee Manufacturing Co., Omaha, Nebr.

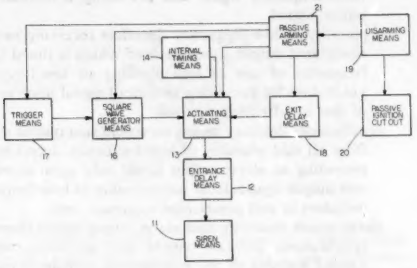
Filed Oct. 18, 1979, Ser. No. 86,117
Int. Cl.³ B60R *25/10*
U.S. Cl. 340—63 **11 Claims**

1. A passive security device, for use with vehicles having an electrical system including a starter, and an ignition switch having "on" and "accessory" contacts, said device comprising:

first means for connecting said device to the electrical system;

detection and alarm means including trigger means for detecting voltage variations and producing an electrical

signal in response thereto, said trigger means being connected to said first means, generating means for converting said electrical signal into a square wave signal, said generating means being connected to said trigger means, siren means for sounding an alarm, and activating means connecting said generating means and said siren means and being responsive to said square wave signal to activate said siren means;



first passive means for arming said detection and alarm means;

second passive means for arming an ignition cut-out circuit; and

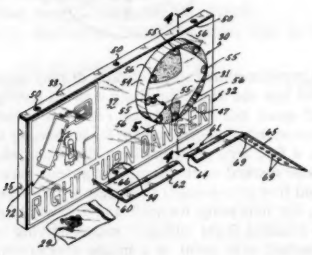
disarming means connected between said first means and said first and second passive means.

4,297,675

SUPPLEMENTAL RIGHT TURN SIGNAL FOR SEMITRAILERS

Nolan R. Rubottom, 1832 W. Corak, West Covina, Calif. 91790, and Jerry W. Fine, 2105 Vallecito Dr., Hacienda Heights, Calif. 91745

Filed Jan. 21, 1980, Ser. No. 113,740
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—107 **5 Claims**



1. A supplemental right turn signal unit for mounting on a semitrailer having the bed of the chassis thereof supported by spaced transverse structural beams and having a pair of landing gears attached to the bottom of the bed of said chassis inward of the front end thereof, said signal unit comprising:

a vertically disposed rectangular sheet metal support member having its marginal top, bottom and side edges bent bak at right angles to the surfaces thereof;

a socket for a light bulb mounted on the upper right portion of the surface of said support member;

a translucent cover enclosing said light bulb, said cover having portions of the face thereof made non-translucent to define an arrow pointing to the right side of the support member, and said cover having a translucent cylindrical sidewall disposed normal to the surface of said support member whereby light emitted by said bulb can radiate sidewardly and downwardly to illuminate indicia including a pictorial indication of the impending danger provided on the left and bottom portion of the surface of said support member;

a bracket having an angular intermediate portion with a horizontal lower end portion and an elongated horizontal upper end portion; and

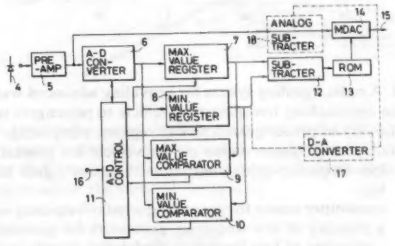
attachment means for attaching said support member beneath the bed of the semitrailers so that the right side thereof is aligned with the sidewall of said semitrailer by attaching the top marginal edge thereof on a transverse structural beam located to the rear and adjacent to the pair of landing gears and by attaching the horizontal lower end portion of said bracket to the bottom marginal edge of said support member and the horizontal upper end portion of said bracket to the next forward transverse structural beam.

4,297,676

MARK SIGNAL AMPLIFIER

Shigeru Moriya, Hoya; Nobuo Hamamto; Kazuo Ichino, both of Tokyo, and Kanji Ozawa, Akishima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,087
Claims priority, application Japan, Dec. 22, 1978, 53-157417
Int. Cl.³ G06K *9/32*
U.S. Cl. 340—146.3 AG **7 Claims**



1. A mark signal amplifier comprising:

first means for obtaining the maximum and minimum values of a mark signal from a detector as detected by scanning an electron beam over a mark area formed on a sample;

second means for obtaining a peak-to-peak value of an amplitude of the detected mark signal from said maximum and minimum values; and

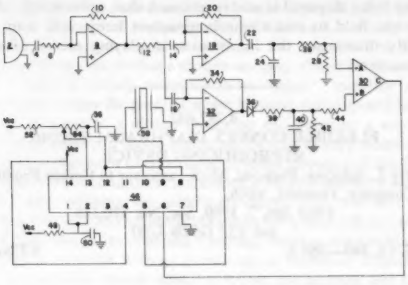
third means for supplying an output signal of a constant amplitude in accordance with said peak-to-peak value of said amplitude independently of fluctuations in said detected mark signal,

wherein said first means comprises means for amplifying said detected mark signal, an analog-to-digital converter for converting said detected mark signal to a digital signal, comparators for comparing the output digital signals from said analog-to-digital converter with the contents of a maximum value register for storing the maximum value of said detected mark signal and with the contents of a minimum value register for storing the minimum value of said detected mark signal, and means to renew the respective contents of the maximum and minimum value registers in accordance with the comparators outputs, whereby said maximum and minimum values of said detected mark signal are obtained.

4,297,677
PERSONAL AMBIENT SOUND REFERENCED ANNUNCIATOR

John S. Lewis, 8525 Wolftrap Rd., Vienna, Va. 22180; Edmond P. DiGiannantonio, 1638 Wateredge La., Reston, Va. 22070, and Howard R. Boyle, Alexandria, Va., assignors to John S. Lewis, Vienna and Edmund P. DiGiannatonio, Reston, both of, Va.

Filed Dec. 10, 1979, Ser. No. 101,735
Int. Cl.³ G08B *13/00*
U.S. Cl. 340—148 **9 Claims**



1. A personal annunciator responsive to present ambient sound conditions in the immediate vicinity of the user who is unable to recognize changes in ambient sound level, comprising:

(a) a small portable housing,

(b) an indicator connected to said housing,

(c) ambient sound receiving means disposed in the housing for picking up the continually varying present ambient sound in the vicinity of the housing and producing a variable amplitude signal reflecting the varying amplitude of the present ambient sound,

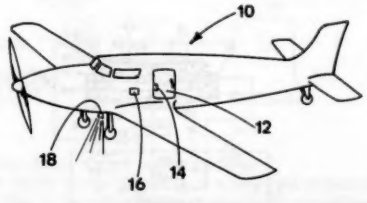
(d) activating signal generating means disposed in the housing and connected to the output of the ambient sound receiving means for receiving the variable amplitude signal therefrom and producing an activating signal only when an abrupt amplitude increase occurs within a fixed predetermined interval, said amplitude being greater by a fixed predetermined increment than the varying sound level received immediately therebefore to which it is referenced, and

(e) the activating signal generating means is connected to the indicator, which on receipt of the activating signal gives the user a non-audible type warning signal which he can readily recognize.

4,297,678
AIRCRAFT SAFETY ALARM SYSTEM

Byung H. Lee, Suite 203, 1810 Craig Rd., St. Louis, Mo. 63101

Filed Jan. 29, 1979, Ser. No. 7,195
Int. Cl.³ C08B *3/10*
U.S. Cl. 340—328 **5 Claims**

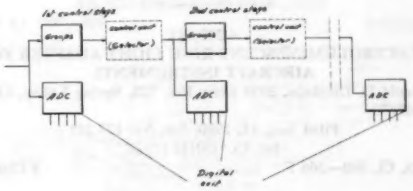


1. An aircraft safety alarm system for sounding an alarm that the aircraft engine may be started, comprising speaker alarm means located outside the aircraft and being connected in an electrical circuit to a switch that is automatically activated by the aircraft operator prior to operating the aircraft, said electrical circuit being connected to a battery and including an alarm circuit and a timer device, said timer device being automatically activated by said switch to operate said alarm circuit for a predetermined time period to activate the speaker means, said timer device becoming de-activated after said predetermined time period to de-energize said alarm circuit and said speaker alarm means, said alarm circuit further including a base oscillator circuit and an audio oscillator circuit to produce an intermittent sound through the speaker alarm means, said audio oscillator circuit being operated at a frequency different than the base oscillator circuit, and audio amplifying means for amplifying the audio tone through the speaker alarm means, said speaker alarm means further including means to produce an intermittent sound that is both a safety alarm as well as a travel alert.

4,297,679
CIRCUIT FOR CONTINUOUS CONVERSION OF SIGNALS INTO DIGITAL MAGNITUDES

Arie Arbel, Haifa, Israel, and Rainer Kurz, Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 541,931, Jan. 17, 1975. This application Jul. 25, 1978, Ser. No. 927,842
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402072
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **12 Claims**

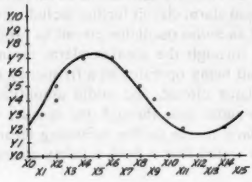


1. An apparatus for converting an analog current or voltage signal into a digital representation of that signal, the apparatus consisting of a plurality of stages to receive the signal, each stage comprising an analog-to-digital convertor and each stage preceding the last stage having a group of differential amplifiers with input thereof connected in parallel with the analog-to-digital converter and designed to fold the signal received a plurality of times and a selector control unit receiving the signal from the group and transmitting the signal to the next succeeding stage, each analog-to-digital convertor being designed to output a plurality of digits representing the binary magnitude of the encoded signal with the digits representing the next most significant binary magnitudes from the preceding stage, the final stage being an analog-to-dital convertor designed to output digits representing the least significant binary magnitudes of the encoded signal, all of the digits together forming a complete binary magnitude representation of the encoded signal.

4,297,680
ANALOG WAVEFORM DIGITIZER

Henriecus Koeman, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Aug. 3, 1979, Ser. No. 63,521
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **10 Claims**



1. A waveform digitizer for digitizing analog signals comprising:

reference voltage means for sequentially producing a series of digitallyderived reference voltages one-at-a-time, each reference voltage having a different voltage value;

comparison means coupled to said voltage reference means for sequentially comparing each of said series of digitally derived reference voltages with an analog signal whose waveform is to be digitized during a series of comparison sequences and producing a comparison pulse each time said reference voltage and the analog signal voltage cross during said comparison sequences;

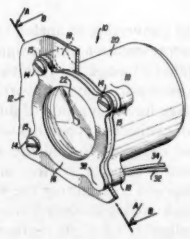
timing means starting at the beginning of each comparison sequence for continuously producing a digital time signal during each comparison sequence; and,

combining means coupled to said comparison means and said timing means for receiving said comparison pulses and said digital time signal and developing a digital word each time a comparison pulse is received, said digital word having a portion related to the value of the digitally derived reference voltage produced by said reference voltage means and a position related to the digital time signal present when said comparison pulse is received.

4,297,681
ELECTROLUMINESCENT RING LIGHT ADAPTER FOR AIRCRAFT INSTRUMENTS

Arnold D. Dircksen, 2974 State Rte. 725, Spring Valley, Ohio 45370

Filed Aug. 11, 1980, Ser. No. 177,241
Int. Cl.³ G01D *11/28*
U.S. Cl. 340—366 F **9 Claims**

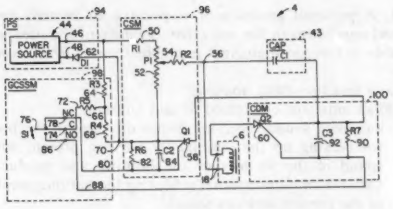


1. In an aircraft indicating instrument having means for displaying information to be viewed externally of the instrument through a substantially planar transparent cover having a peripheral edge and inner and outer surfaces, said cover being arranged in front of the displaying means and means mounted to said instrument for illuminating said displaying means, the improvement wherein said illuminating means comprises an electroluminescent lamp arranged externally of said instrument, means for removably mounting said electroluminescent lamp in non-sealed, confronting relation with the outer surface of said transparent cover and means connected to said electroluminescent lamp for supplying an electric field thereto, said removable mounting means comprising an adapter element surrounding and in overlapping relation with the peripheral edge of the planar transparent cover, said adapter element having a recess on the side thereof confronting the peripheral edge of the planar transparent cover, said electroluminescent lamp being disposed in said recess such that, upon supply of an electric field to said electroluminescent lamp, said lamp directly illuminates the information displaying means of said instrument.

4,297,682
FLEXIBLE CONVEX DIAPHRAGM SOUND REPRODUCING DEVICE

Barry L. Spletzer, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Filed Jan. 7, 1980, Ser. No. 110,160
Int. Cl.³ G08B *3/00*
U.S. Cl. 340—384 E **9 Claims**



1. Apparatus for reproducing the sound produced when a convex, thin, flexible diaphragm is flexed comprising:

an electromagnetic coil;

means for mounting a relatively thin electrically conductive flexible plate adjacent to one end of said coil;

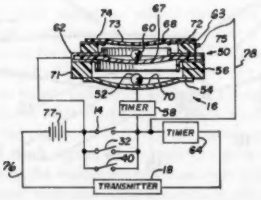
said coil and said mounting means configured to allow said flexible plate to flex; and

means, electrically coupled to said coil and to a power source having a first terminal and a second terminal, for selectively energizing said coil whereby said flexible plate deflects and vibrates thereby reproducing said sound.

4,297,683
VANDAL ALARM SYSTEM FOR PARKING METERS

Ralph R. Roberts, 740 Hillsdale Ave., Hillsdale, N.J. 07642

Continuation-in-part of Ser. No. 23,014, Mar. 22, 1979, abandoned. This application Mar. 6, 1980, Ser. No. 127,589
Int. Cl.³ G08B *19/00, 25/00*
U.S. Cl. 340—539 **8 Claims**



1. A parking meter vandal alarm apparatus which includes a

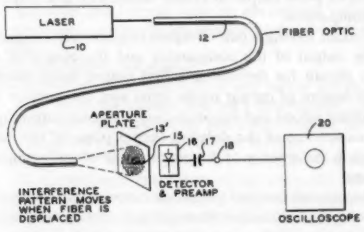
radio transmitter secured therein and adapted to send a radio signal in response to an electrical actuation signal to a radio receiver, said signal indicated on a monitor, said apparatus including: (a) a parking meter of conventional construction including a housing and having at least one access door to be opened and closed by a key or the like; (b) a battery within said parking meter housing; (c) a first switch in association with said access door and disposed in a normally open condition, any slight movement toward the opening of the access door causing the switch to close and produce a first electrical actuation signal produced by said battery; (d) a first timer in association with said first switch and having a timed period of selected duration whereby the closing of said first switch causes the electrical actuation signal to continue for said selected time period beyond the closing and then opening of said first switch; (e) a first tilt switch normally in an "open" condition and contained within the parking meter housing and disposed so as to be actuated to a closed condition and produce a second electrical actuation signal produced by said battery when the housing is displaced to an attitude of about twenty to forty-five degrees; (f) a second timer associated with said first tilt switch, said timer delaying the produced signal from the first tilt switch in the closed actuated condition for a selected period of time, this time delay enabling a jarring, shaking and the like of the meter to occur without producing an electrical actuation; (g) a second tilt switch which is within the housing and support, said second tilt switch in a normally "open" condition and being activated to a closed condition when the housing and/or a support is tilted to more than forty-five degrees producing an electronic signal produced by said battery indicating a tilt of the housing beyond said designated angle, such an angle indicating vandalism which may also include cutting of the support; (h) a conducting means in association with this second tilt switch connected to feed a produced signal to and through said first timer and producing an electrical signal persisting for a determined period of time after actuation; (i) a radio transmitter of a relatively short range powered by said battery and arranged so that when a switch is closed an actuation signal produced by said battery is supplied to the transmitter and at least one frequency signal is broadcast from the transmitter, and (j) a radio receiver at a distance from the transmitter and having a constant "on" power source and having means for monitoring said signals.

4,297,684

FIBER OPTIC INTRUDER ALARM SYSTEM

Charles D. Butter, Cologne, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 26, 1979, Ser. No. 24,125
Int. Cl.[3] G08B *13/22, 13/10*
U.S. Cl. 340—557 **8 Claims**



1. Intruder detector apparatus comprising:

intruder sensor means consisting of a length of multimode optic fiber to be positioned in an area under surveillance for intruders;

means directing a source of coherent light into said optic fiber for transmittal through said length of fiber, said transmitted coherent light emanating from the end of the fiber in a generally cone-shaped beam; and,

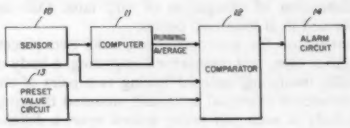
light detector means receiving at least a portion of the coherent light beam emanating from said fiber, the cross section of the light beam exhibiting an interference pattern of light intensity, and which interference pattern changes when said sensor means is deformed by the presence of an intruder.

4,297,685

APPARATUS AND METHOD FOR SLEEP DETECTION

Edward C. Brainard, II, Marion, Mass., assignor to Environmental Devices Corporation, Marion, Mass.

Filed May 31, 1979, Ser. No. 44,268
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—575 **13 Claims**



1. Apparatus for detecting the onset of sleep in a human being, said apparatus comprising:

means, including a temperature responsive sensor, for measuring the temperature within the auditory canal of said human being;

differentiator means interconnected with said temperature measuring means for generating the time rate of change of said temperature; and

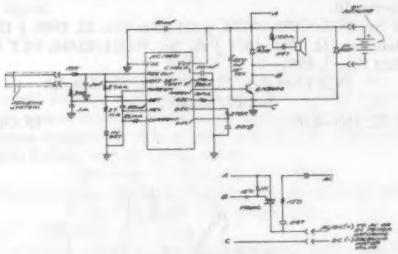
comparator means for producing an output signal when said time rate of change of said temperature exceeds a predetermined value.

4,297,686

WATER DETECTION DEVICE

M. Dale Tom, R.D. #1, Norwich, Ohio 43767

Filed Oct. 1, 1979, Ser. No. 80,658
Int. Cl.[3] G08B *21/00;* F16K *23/00*
U.S. Cl. 340—604 **4 Claims**



1. A resistive liquid detection and shut-off system comprising:

means for detecting liquid drips, flows and trickles, but not liquid beads, on a floor area where liquid damage could result, said means including an elongated sensor comprising a flexible plastic tape with an adhesive backing and having a surface thereof with a pair of conductive metal strips thereon spaced apart in a dimension perpendicular to the dimension of elongation of said tape;

detection circuit means operatively connected to said elongated sensor for measuring resistance changes in said elongated sensor;

a solenoid-operated water shut-off valve;

output circuitry means operatively connected to said detec-

tion circuit means and said water shut-off valve for activating said water shut-off valve in response to predetermined resistivity changes in said elongated sensor;

a battery for providing power for said detection circuit means, solenoid valve operator, and said output circuitry means; and

battery monitoring circuitry means operatively connected to said battery and said shut-off valve for monitoring the strength of said battery and for operating said shut-off valve if said battery strength drops below a predetermined value.

3. A resistive liquid detection system comprising:

means for detecting liquid drips, flows and trickles, but not liquid beads, on a floor area where liquid damage could result, said means including an elongated sensor comprising a flexible plastic tape with an adhesive backing and having a surface thereof with a pair of conductive metal strips spaced apart in a dimension perpendicular to the dimension of elongation of said tape, said tape being formed in at least two pieces;

a connector for interconnecting said two pieces of said sensor tape, said connector comprising: a body of electrically insulating material having two pairs of electrically connected electrical terminals mounted thereon, the terminals of each pair being spaced apart a distance corresponding to the spacing of said conductive metal strips; means defining a pair of slots in said body, each for receipt of a piece of said tape for allowing said conductive metal strips of said tape to contact said terminals within said body; and adhesive for maintaining each piece of said tape in contact with said connector body;

detection circuit means operatively connected to said elongated sensor for detecting changes in the resistivity thereof;

an alert means for alerting an individual to resistivity changes in said sensor means;

output circuitry means operatively connected to said detection circuit means and said alert means for activating said alert means in response to predetermined resistivity changes in said elongated sensor; and

power means for providing electrical current for powering said circuitry means and said alert means.

4,297,687

LEAK DETECTION APPARATUS

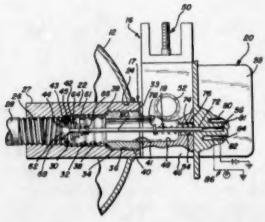
Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00180, § 371 Date Feb. 22, 1980, § 102(e) Date Feb. 22, 1980, PCT Pub. No. WO81/02484, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 22, 1980, Ser. No. 130,488

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—626 **15 Claims**



1. A leak detection apparatus (**18**) for a pressurized system having a source of pressurized fluid (**12**) and a distribution system (**14**) having at least one outlet (**100**) for said pressurized fluid, said distribution system (**14**) being maintained under pressure approximately equal to the pressure of the pressurized fluid in said source comprising:

means (**38,138, 62,162**) for sealing the source of pressurized fluid (**12**), said means (**38,138, 62,162**) including a movable member (**62,162**) seatable on a seat (**68,168**) positioned between said source of pressurized fluid and said distribution system (**14**);

rod means (**60,160,260**) carried by said movable member (**62,162**) and being movable with said movable member (**62,162**); and

means (**82,182,295**) operatively conditioned by movement of said movable member (**62,162**) and of said rod means (**60,160,260**) for signalling a pressure differential between said source of pressurized fluid (**12**) and said distribution system (**14**).

4,297,688

PHOTOELECTRIC SMOKE SENSING AND ALARMING DEVICE

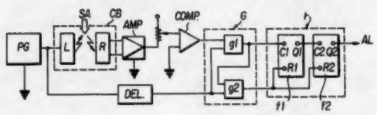
Takao Kakigi, Tokyo, Japan, assignor to Cybernet Electronics Corp., Kawasaki, Japan

Continuation-in-part of Ser. No. 107,041, Dec. 26, 1979, which is a continuation of Ser. No. 942,186, Sep. 14, 1978, abandoned. This application Jan. 2, 1980, Ser. No. 109,145

Claims priority, application Japan, Sep. 30, 1977, 52-131414[U]

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—630 **1 Claim**



1. A photoelectric smoke sensing and alarming device of a type having a pulse generator, a chamber, a light emitting element disposed in said chamber and adapted to emit a light beam in the form of pulses in cooperation with said pulse generator, and a light-receiving element disposed in said chamber and adapted to receive the light from said pulses of light beam, so as to sense the presence of smoke in said chamber through a detection of scattering of said light beem caused in said chamber by said smoke, comprising:

an amplifier having gain control and connected to said light-receiving element for producing an output upon reception of light by said light-receiving element;

a threshold detecting comparator for producing a pulse output when the output of said amplifier exceeds a predetermined threshold level;

a delay circuit coupled to the pulse generator for producing a delayed pulse output in synchronism with the output of the comparator;

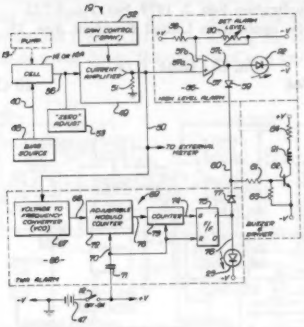
a gate circuit having a pair of inputs respectively connected to the output of the comparator and the output of the delay circuit for delivering a first output upon simultaneous receipt of output pulses from said comparator and said delay circuit and for producing a second output upon the occurrence of the delayed output pulse of the delay circuit in the absence of the output pulse of said comparator; and

a flip-flop circuit coupled to said gate circuit and adapted to be set by the first output from said gate circuit, wherein an alarm is generated over a time length which is at least as long as the time between successive of said pulses generated by said pulse generator, only when at least n ($n>2$) successive of said first outputs are delivered by said gate circuit to said flip-flop circuit, said second output of said gate circuit being used to reset the flip-flop circuit in the absence of successive first output signals from said gate circuit.

4,297,689
PERSONNEL-CARRIED DOSIMETER

Manuel Shaw, Bel Air, and Imbrie Thatcher, Chatsworth, both of Calif., assignors to Interscan Corporation, Chatsworth, Calif.

Filed Jan. 8, 1980, Ser. No. 110,359
Int. Cl.³ G01N *27/46, 27/54;* G08B *23/00*
U.S. Cl. 340—632 **17 Claims**

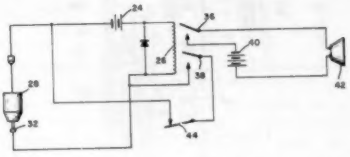


1. An electrochemical sensing cell for use in a dosimeter, comprising:
- a housing including a body having a planar base and upright sides extending thereform to define an interior region and a lid emplaceable atop said sides to enclose said interior region,
- a zigzag recess in said base opening into said interior region, together with a pair of openings through said body at the respective ends of said recess, said openings serving respectively as inlet and outlet ports for the flow of gas through said cell,
- a generally planar sensing element disposed in said body interior region atop said base, gas entrant to the cell through said inlet port flowing throgh said zigzag recess in contact with said sensing electrode along substantially the entire length of said recess, said gas then exiting through said outlet port,
- a reference electrode and an electrolyte also disposed within said interior region, the electrical current developed across said sensing and reference electrodes in the presence of a certain contaminant in said gas being indicative of the concentration of that contaminant in the gas,
- an annular seal between said base and said sensing electrode and surrounding said zigzag recess, said seal limiting the flow of gas between said base and said sensing electrode to within a perimeter defined by said seal, and
- a flow channel extending from said inlet port along the exterior of said base and thence through at least one of said walls and through said lid, gas thereby being supplyable to said recess via said channel from a location atop said lig.

6. A dosimeter comprising:
- an electrochemical sensing cell and means for enabling the entry of a gas sample into said sensing cell, the current from said cell indicating the concentration of a certain contaminant species in said gas sample,
- a "high level" alarm circuit means, connected to said cell, for providing a first alarm signal when the current from said cell indicates that the present concentration of said certain contaminant species exceeds a first threshold limit value, and
- a "time weighted average" alarm circuit means, also connected to said cell and operative over a certain extended time duration, for providing a second alarm signal when the current from said cell, effectively integrated over a time interval less than or equal to said certain duration, indicates that the time weighted average concentration level of said contaminant species has exceeded a second threshold limit value during that interval, said "time weighted average" alarm circuit means including:
- a frequency converter, cooperatively connected to said cell, for providing an output pulse signal having a frequency proportional to the current from said cell, and
- a counter connected to count the pulses from said frequency converter, said second alarm signal being produced when the count of said counter reaches a preset value within said certain extended time duration.

4,297,690
EARTHQUAKE ALARM SYSTEM

Gerald E. Baker, 23018 Arlington Ave., Torrance, Calif. 90501
Continuation-in-part of Ser. No. 933,166, Aug. 14, 1978. This application Mar. 5, 1980, Ser. No. 127,428
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—690 **3 Claims**



1. An earthquake alarm comprising:
- a member having a referenced support at one end,
- a mass attached at the opposite end of said member a fixed distance from said referenced support,
- said mass being supported to have a preferred vertical position for a movement in a lateral direction only,
- adjustable mechanical detecting means for limiting the impulse lateral movement of said mass without changing the fixed distance of said mass from said referenced support,
- said mass being cylindrical and containing an opening at the lowermost end for accepting a vertically aligned adjustable probe attached to said mechanical detecting means and adapted to be selectively located in said opening without touching said mass, and
- electrical means connecting said mechanical detecting means with an audio generating device for translating selected impulse movement of said mass into an audible signal.

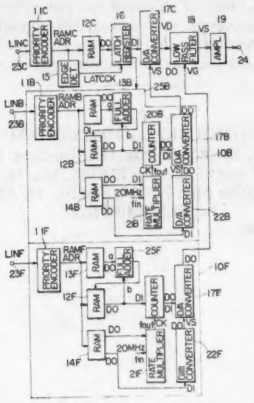
4,297,691
FIGURE DISPLAYING DEVICE

Kazuyuki Kodama, Kokubunji; Kunihiro Okada; Takeyuki Endoh, both of Hinode, and Yasutaka Shibuya, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 29, 1979, Ser. No. 70,821
Claims priority, application Japan, Aug. 30, 1978, 53-104944
Int. Cl.³ G06F *3/14;* G09B *9/00*
U.S. Cl. 340—723 **4 Claims**

1. A figure displaying device comprising display means for displaying information of a figure, first generation means for generating a brightness signal which corresponds to the figure information to be displayed, second generation means for generating a brightness modulation signal which varies continuously in at least one direction within a predetermined first region on a display screen of said display means, third generation means for generating a frequency characteristic control signal which varies continuously in at least one direction within a predetermined second region on said display screen which is in overlapping relationship with at least a portion of said first region, modulation and control means connected to said first, second and third generation means for brightness-modulating the brightness signal from said first generation means in accordance with the signal from said second genera-

tion means and for controlling a frequency characteristic of the brightness signal from said first generation means in accordance with the signal from said third generation means to selectively vary the composition of frequency components in



the brightness signal and thereby affect the resolution of the displayed image, and means for applying the modulated and controlled brightness signal from said modulation and control means to said display means.

4,297,692

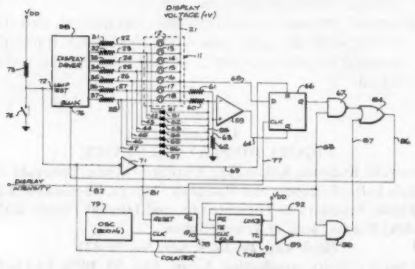
SEGMENT FAILURE DETECTOR FOR DIGITAL DISPLAY

Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Continuation of Ser. No. 18,209, Mar. 7, 1979, abandoned. This application Apr. 8, 1980, Ser. No. 138,474

Int. Cl.[3] G06F *3/14*; G09F *9/32*

U.S. Cl. 340—715 **7 Claims**



1. A digital display device including:

a power source connected to drive the digital display device;

a plurality of character-forming display segments;

a driver circuit connected to the plurality of display segments to selectively energize the plurality of display segments;

a failure detection circuit connected to the plurality of display segments to detect the failure of any of the plurality display segments to energize; and to generate a blanking signal indicative of display segment failure;

an override circuit to override the blanking signal;

wherein the driver circuit is connected to the failure detection circuit to receive the blanking signal such that the driver circuit de-energizes the plurality of display segments on receipt of the blanking signal; and

wherein the override circuit is connected to the driver circuit such that the timer circuit overrides the blanking signal to permit energizing of the plurality of non-failed display segments by the driver circuit.

4,297,693

APPARATUS FOR DISPLAYING GRAPHICS SYMBOLS

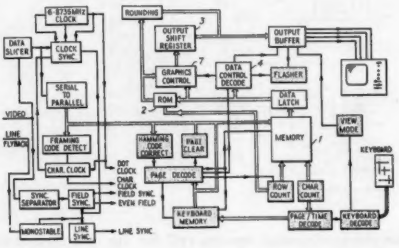
Robert Parsons, St. Neots, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 806,415, Jun. 14, 1977, abandoned. This application Feb. 2, 1979, Ser. No. 8,722

Claims priority, application United Kingdom, Jun. 21, 1976, 25726/76

Int. Cl.[3] G06F *3/14*

U.S. Cl. 340—744 **10 Claims**



1. Apparatus for controlling the display of information which is built up line by line on a raster-type display in response to digital coded data and mode control signals selectively occurring during individual lines of said display, there being a plurality of modes including a graphics mode in which data signals can be displayed during a respective line of said display, the mode control signals indicating the mode in which subsequent data signals are to be displayed during at least part of that line but not themselves generating a display, the apparatus including graphics symbol store means for providing in the graphics mode, in parallel, signals representative of the specified graphics symbol until a further data signal is received, parallel to serial converter means for securing the parallel signals from the graphics symbol store means and in response thereto producing in serial form, signals characteristic of the graphics symbol to be displayed, and control logic means for changing the contents of the graphics symbol store means in response to a graphics symbol signal and to cause said store means to continue to produce the parallel signals already stored in the graphics symbol store means for the duration of a mode control signal when the said mode control signal occurs in place of a data signal during the display of graphics symbols and thereby avoid a blank space in said display resulting from occurrence of said mode control signal.

4,297,694

SYMBOL GENERATOR FOR A GRAPHIC CONSOLE

Philippe Matherat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 16, 1979, Ser. No. 39,260

Claims priority, application France, May 18, 1978, 78 14765

Int. Cl.[3] G06F *3/153*

U.S. Cl. 340—750 **18 Claims**

1. A symbol generator for tracing, on a sensitive medium, alphanumeric characters and the like, said characters being formed on a grid comprising l.P adjacent columns, each column comprising m.Q points, said generator comprising:

(a) first and second input busses, each connectable to an external control means (MPU), said first bus comprising a data channel (MPDB) and said second bus comprising an address channel (MPAB);

(b) means for supplying a clock signal (CKIN) to control the timing of said symbol generator;

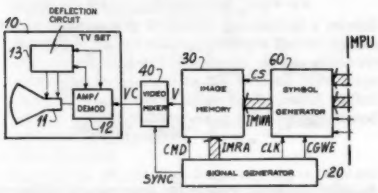
(c) a character memory (65), connected to said first and

second input busses, said memory having lX m memory calls for each character and further comprising:

1. first and second addressing inputs; and

2. a signal output for driving said sensitive medium;

(d) a writing pointer circuit (66) connected to said first and second input busses, said pointer circuit comprising first (X) and second (Y) up/down counters connected to said clock signal supplying means, each of said counters having first (ENX) and second (ENY) enabling inputs and a command input (U/DY) for setting the counter to count up or count down, the outputs of said up/down counters



respectively comprising the X and Y address inputs for the means driving said sensitive medium; and

(e) a writing circuit (61), connected to said first and second input busses and to said clock signal supplying means, said writing circuit including means, responsive to the factors P and Q, for programming said writing circuit, said writing circuit having first, second, and third outputs respectively corresponding and connected to the first and second enabling inputs and the command input of said writing pointer circuit, and first and second address outputs respectively corresponding and connected to the first and second addressing inputs of said character memory.

4,297,695

ELECTROCHROMIC DISPLAY DEVICE

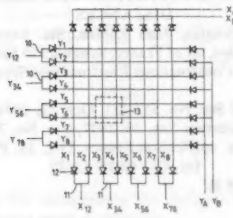
Richard C. Marshall, Harpenden, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1979, Ser. No. 103,910

Claims priority, application United Kingdom, Dec. 28, 1978, 50066/78

Int. Cl.³ G02F 1/17

U.S. Cl. 340—752 **5 Claims**



1. A display device including apparatus for electrically addressing a material in matrix fashion wherein each individual point in the matrix is addressable to produce a local change in an optical characteristic of the material by the application at that point of two electrical signals, the improvement comprising

first and second matrix addressing means for sequentially applying first and second electrical signals to said matrix, the combination of which is sufficient to cause said local change,

said first matrix addressing means for selectively applying said first signals to groups of rows and columns of said matrix defining submatrices,

said second matrix addressing means for selectively applying said second signals to individual rows and columns in said submatrices to select at least one of said individual points in said submatrices and produce said local change thereat.

4,297,696

COLOR UNIFORMING DRIVE IN AN ELECTROCHROMIC DISPLAY DEVICE

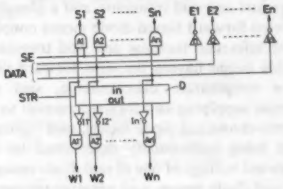
Sadakatsu Hashimoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 23, 1980, Ser. No. 143,015

Claims priority, application Japan, Apr. 24, 1979, 54-50968

Int. Cl.³ G06F 3/14

U.S. Cl. 340—785 **4 Claims**



1. In a drive system for driving an electrochromic display cell during a coloration period, and a bleaching period, said display cell having a memory period when said drive system is not driving said electrochromic display cell, said drive system including an external power source, said cell including an electrochromic material and a predetermined number of display segments, different combinations of said display segments defining different desired display patterns, said drive system comprising:

coloration means for conducting coloration operations by applying a coloration voltage to selected ones of said display segments during said coloration period;

holding means for maintaining colored segments in an electrically opened state for a predetermined period of time after completion of said coloration period; and

communication means for electrically connecting said colored segments with each other during said memory period after completion of operation of said holding means.

4,297,697

POWER SUPPLY METHOD FOR LIQUID CRYSTAL DISPLAY

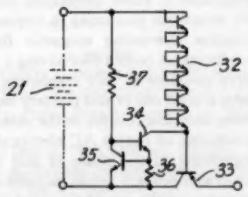
Yoshihiro Mitsui, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 29, 1978, Ser. No. 974,402

Claims priority, application Japan, Dec. 29, 1977, 52/159275

Int. Cl.³ G08B 5/36

U.S. Cl. 340—813 **3 Claims**



1. A power supply for a liquid crystal display, comprising:

DC power source means for delivering a source voltage larger than the driving voltage for driving said display,

said power source means having first and second reference terminals;

voltage regulator means coupled to said power source means for receiving said source voltage and in response thereto supplying a regulated output voltage having a negative temperature characteristic, said regulated output voltage corresponding to the driving voltage of said display, said voltage regulator means including first and second output terminals for outputting said regulated voltage,

logic circuit means coupled intermediate said first and second output terminals and said liquid crystal display for receiving said regulated output voltage and in response thereto selectively driving said liquid crystal display;

a transistor coupled in series between said second reference terminal and said second output terminal;

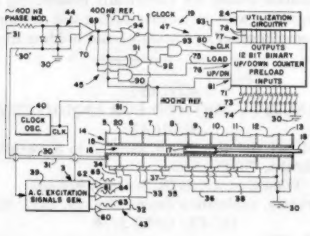
said voltage regulator means including constant-current circuit means coupled intermediate said first reference terminal and said transistor, and a plurality of series-connected forward biased diode means coupled between said first reference terminal and said transistor, each of said diode means having the same forward voltage and negative temperature characteristic, said constant-current circuit supplying said forward current to said plurality of series-connected diode means, said regulated output voltage being substantially determined by multiplying the forward voltage of one of said diode means by the number of said diode means, said negative temperature characteristic of said regulated output voltage being substantially determined by multiplying the negative temperature characteristic of said forward voltage of one of said diode means by the number of diode means.

4,297,698

360 DEGREE LINEAR VARIABLE PHASE TRANSFORMER

Michael A. Pauwels, Kalamazoo, and Abraham L. Poot, Portage, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Nov. 2, 1977, Ser. No. 847,938
Int. Cl.[3] G08C *19/06*; H01F *21/06*
U.S. Cl. 340—870.32 **38 Claims**



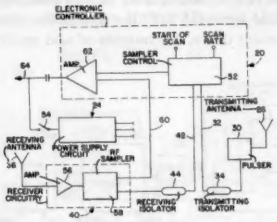
1. A displacement to phase transducer, comprising at least three primary means for producing in response to alternating current excitation alternating magnetic fluxes, combining means for producing an output flux having a phase dependent on the relative positions of said combining means and said primary means, at least one of said primary means and combining means being movable relative to the other, and secondary means for producing an output AC electrical signal having a phase corresponding to the phase of said output flux, and wherein each of said primary means includes a plurality of full layers of circumferentially wound turns and at least one partial layer of circumferentially wound turns so arranged to provide a substantially linear relation between the phase of said output flux with respect to the relative positions of said combining meand and said primary means.

4,297,699

RADAR DRILL GUIDANCE SYSTEM

James C. Fowler, Burke; Steven D. Hale, Vienna, both of Va., and Theodore E. Moser, Rockville, Md., assignors to Ensco, Inc., Springfield, Va.

Filed Oct. 24, 1979, Ser. No. 87,811
Int. Cl.[3] G01S *13/02*
U.S. Cl. 343—5 NA **19 Claims**



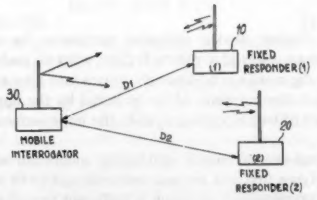
10. A radar guidance system for determining subterranean distances including a source of electromagnetic pulses, a transmitting means connected to said source of electromagnetic pulses to transmit said electromagnetic pulses into the earth, a receiving means positioned in spaced relationship to said transmitting means to receive electromagnetic energy which returns to said receiving means following the reflection of said electromagnetic pulses from various geological discontinuities within the earth, a control circuit means connected to both said source of electromagnetic pulses and said receiving means for controlling both the transmission of said electromagnetic pulses from said transmitting means and the reception of said electromagnetic energy by said receiving means, said control circuit means being positioned in spaced relationship relative to said transmitting means such that said transmitting means is positioned intermediate said control circuit means and said receiving means, said radar guidance system also including a casing which encloses said source of electromagnetic pulses, said transmitting means, said receiving means and said control circuit means, said casing having a shielding element mounted around the inner surface thereof to prevent direct electromagnetic coupling between said transmitting means and said receiving means.

4,297,700

METHOD AND APPARATUS FOR MEASURING DISTANCES

Georges Nard, Nantes; Jean Rabian, Ste. Luce, and Michel Rouaud, Thouare, all of France, assignors to Societe d'Etudes, Recherches et Constructions Electroniques Sercel, Carquefou, France

Continuation of Ser. No. 517,157, Oct. 22, 1974, abandoned.
This application Jan. 26, 1977, Ser. No. 762,729
Claims priority, application France, Oct. 23, 1973, 73 37740
Int. Cl.[3] G01S *13/80*
U.S. Cl. 343—6.5 R **14 Claims**



1. A ranging method, comprising the following steps:

at a first location;

transmitting during a first time-period a first high frequency wave train comprising a carrier signal of predetermined frequency being phase-reversal modulated according to a first repetitive chain of a known pseudo-random sequence of binary elements,

at a second location:

receiving the first high-frequency wave train and correlating the first repetitive chain of the known pseudo-random sequence, said first chain of the sequence being modulated on said first wave train, with a local second repetitive chain of the same pseudo-random sequence, said second repetitive chain being shifted with respect to time so as to substantially coincide with the first repetitive chain received, and

transmitting during a second time-period a second high frequency wave train comprising a carrier signal of the same predetermined frequency being phase-reversal modulated according to the second local repetitive chain of the pseudo-random squence thus shifted, said second time-period extending after and disjointed from said first time-period,

at a third location:

receiving the second high-frequency wave train and correlating the second repetitive chain of the known pseudo-random sequence, said second chain of the sequence being modulated on said second wave train, with a third local repetitive chain of the same pseudo-random sequence, said third repetitive chain being shifted with respect to time until it is caused to coincide with the second repetitive chain received, and

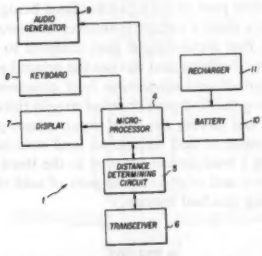
sensing the time shift between the thus shifted third repetitive chain of the pseudo-random sequence and a fourth repetitive chain of the pseudo-random sequence, and sequentially repeating these steps with each of the first and second transmission time-periods of the first and second wave trains being disjointed.

4,297,701

RANGEFINDER USING EXPANDED TIME DELAY

Lance Henriques, New York, N.Y., assignor to John D. Angleman, Brookside, N.J.

Filed Aug. 8, 1979, Ser. No. 64,390
Int. Cl.[3] G01S *13/78*
U.S. Cl. 343—6.5 LC **7 Claims**



1. A system for determining the distance between a first point and a second point comprising:

(a) first transceiver means located at the first point for transmitting a first signal burst on a given frequency and for receiving signals on the given frequency;

(b) second transceiver means located at the second point for receiving the first signal burst on the given frequency and for retransmitting a second signal burst on the given frequency in response to the first signal burst; and

(c) timing means for measuring the period of time between the transmission of the first signal burst by the first transceiver means and the receipt of the second signal burst by the second transceiver means, whereby the period of time is directly proportional to the distance between the first point and the second point, said timing means being comprised of an integrator including a capacitor, a means for linearly charging the capacitor at a charge rate during the period of time, a means for linearly discharging at a slower rate than said charge rate the capacitor after the period of time, a threshold detector for detecting when the state of charge of the capacitor reaches a predetermined value;

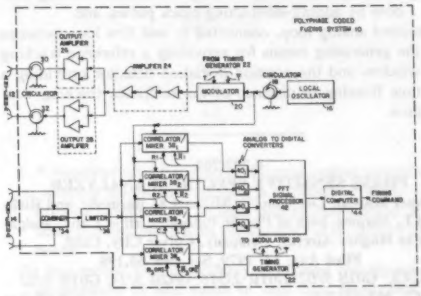
(d) and a microprocessor for measuring an amount of time that the capacitor is charged to a value of at least said predetermined value, the amount of time corresponding to said distance between the first point and the second point.

4,297,702

POLYPHASE CODED FUZING SYSTEM

Irven S. Carnes, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 24, 1978, Ser. No. 909,098
Int. Cl.[3] G01S *13/26*
U.S. Cl. 343—7 PF **2 Claims**



1. In a radar fuzing system for use in a guided missile, such system being adapted periodically to transmit a radio frequency signal modulated in accordance with a predetermined polyphase code and, after reception of an echo signal, to process such signal in a bank of similar correlator/mixers, each one of such correlator/mixers comprising:

(a) first and second dual gate field effect transistors;

(b) means, operative during selected successive intervals of time between the transmission of each predetermined polyphase code, for alternately biasing the first and second dual gate field effect transistors into a conducting state;

(c) means for applying a local oscillator signal to one of the gates of each one of the first and the second dual gate field effect transistors;

(d) means for applying the echo signal directly to the second gate of one of the dual gate field effect transistors and for reversing the phase of such signal and applying the resulting signal to the second gate of the second one of such transistors; and

(e) means for combining the output signals from the dual gate field effect transistors.

4,297,703

TELEMETRY DEVICE FOR TRACKING RADAR AND RADAR SYSTEM COMPRISING SUCH A DEVICE

Philippe Lacomme, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 4, 1979, Ser. No. 100,143
Claims priority, application France, Dec. 5, 1978, 78 34225
Int. Cl.[3] G01S *13/70*
U.S. Cl. 343—7.3 **7 Claims**

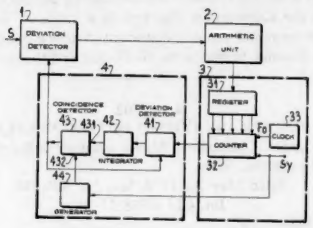
4. A telemetry device for tracking radar comprising:

a first loop for tracking the distance of a moving echo comprising

a first deviation detector for determining the position deviation of an echo signal and a telemetry mark,

means for the digital calculation of the distance of the echo,

means for generating clock pulses of a predetermined repetition frequency, and



generating means for providing a reference tracking window by adding-subtracting clock pulses, and

a second analog loop, connected in said first loop between the generating means for providing a reference tracking window and the position deviation detector providing a time filtering in distance of the reference tracking window.

4,297,704

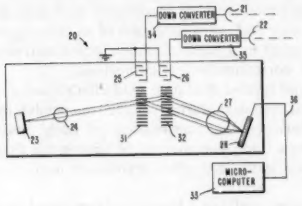
PHASE SENSITIVE SPECTRUM ANALYZER

Emanuel Marom, Los Angeles; Michael K. Barnoski, and Richard L. Abrams, both of Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 13, 1979, Ser. No. 66,199

Int. Cl.[3] **G01S** *5/02;* **G01R** *23/16;* **G02B** *5/14;* **G01B** *9/02*

U.S. Cl. 343—113 R **6 Claims**



1. An acousto-optic processing arrangement which determines the direction of arrival of energy applied thereto, said arrangement comprising:

a laser source;

a first lens disposed to collimate laser light provided by said laser source;

a second lens disposed to focus the collimated laser light provided by said first lens;

a detector array disposed at the focal plane of said second lens;

two surface acoustic wave transducers disposed between said first and second lenses and adjacent to an optical path between said lenses, said two surface acoustic wave transducers being disposed adjacent to one another and disposed such that the surface acoustic waves radiated thereby are substantially parallel to one another;

two antennas, each antenna being individually coupled by means of separate downconverters to one of said surface acoustic wave transducers, said antennas being disposed so as to have their respective lines-of-sight substantially parallel to one another; and

computer means coupled to said detector array for determining the direction of arrival of said applied energy.

4,297,705

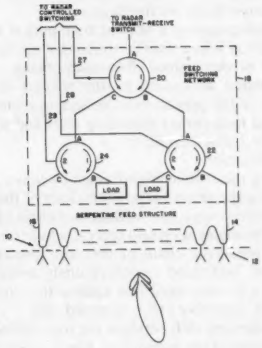
FREQUENCY AGILITY TECHNIQUE FOR FREQUENCY SCANNED ANTENNA

Robert R. Boothe, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 3, 1980, Ser. No. 126,516

Int. Cl.[3] **H01Q** *3/26, 13/10*

U.S. Cl. 343—771 **3 Claims**



1. A frequency agility circuit for a frequency scanned antenna comprising: bidirectional switching means adapted for coupling electromagnetic radiation therethrough, said switching means being adapted for receiving energy from a source of electromagnetic radiation; a serpentine feed structure coupled to said switching means for directing electromagnetic radiation bidirectionally therethrough, said serpentine feed structure being adapted for coupling said radiation to and from a frequency scanned antenna array, and said serpentine feed structure having first and second feed inputs for directing energy bidirectionally therethrough; and wherein said switching means comprises first, second, and third microwave circulators, each circulator having first, second, and third input-output ports, said first port of the first circulator being adapted for receiving energy from a radiation source, said second circulator having the first input-output port coupled to said second port of the first circulator and having the second port coupled to the first input of said serpentine feed structure, said third circulator having the first port coupled to said third port of the first circulator and having the third input-output port coupled to the second input of said serpentine feed structure; and further comprising a load circuit coupled to the third port of said second circulator and to the second port of said third circulator for absorbing residual energy.

4,297,706

CIRCULARLY POLARIZED SLOTTED PYLON ANTENNA

Nicholas Nikolayuk, Gibbsboro, N.J., assignor to RCA Corporation, New York, N.Y.

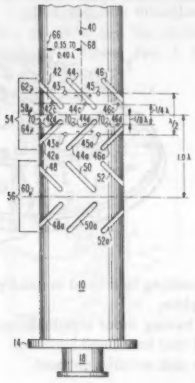
Filed Mar. 17, 1980, Ser. No. 131,273

Int. Cl.[3] **H01Q** *13/12*

U.S. Cl. 343—771 **11 Claims**

1. An antenna comprising a conducting vertical cylinder having a plurality of slots, said slots being disposed in a plurality of vertically stacked bays, each bay comprising at least one pair of slots disposed at about right angles to each other, slots of each pair being vertically spaced with respect to each other by about one half of a wavelength of a desired center frequency, said vertical spacing being established between hori-

zontal centers of said slots, and means for exciting said slots so that slots comprising a pair are in about ninety degree time



phase relationship and have about equal amplitudes with respect to each other.

4,297,707

MULTIPLE OMNIDIRECTIONAL ANTENNA

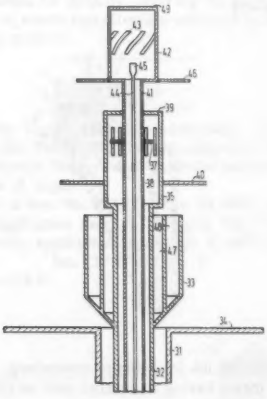
Anton Brunner, Wangen, and Nikolaus Willburger, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 810,592, Jun. 27, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,228

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629502

Int. Cl.[3] **H01Q** *13/12*

U.S. Cl. 343—725 **5 Claims**



1. An omnidirectional end antenna which forms an assembly with one or more other antennas mounted on a common axis comprising a wave shaping base plate member (**10, 21, 46**), a coaxial feed line having an outer conductor (**8, 19, 41**) attached to said base plate member (**10, 21, 46**) on one side thereof and extending through said one or more other antennas, an opening formed in said base plate member, an inner conductor (**8***a*, **19***a*, **44**) of said feed line extending for a finite length through said opening formed in said base plate member (**10, 21,46**), a cylindrical shaped radiating member (**6, 17, 42**) into which the end of feed line extends attached to the second side of said base plate member (**10, 21, 46**) and formed with a short circuit cover member (**11, 23, 49**) over its remote end, and at least one radiating slot (**7, 14, 43**) formed in the side walls for radiating radiant energy.

4,297,708

APPARATUS AND METHODS FOR CORRECTING DISPERSION IN A MICROWAVE ANTENNA SYSTEM

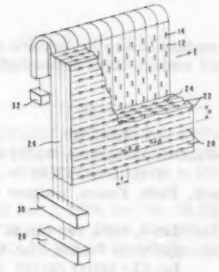
Paul Vidal, Paris, France, assignor to Societe d'Etude du Radant, Orsay, France

Filed Jun. 22, 1978, Ser. No. 918,152

Claims priority, application France, Jun. 24, 1977, 77 19364

Int. Cl.[3] **H01Q** *19/06*

U.S. Cl. 343—754 **13 Claims**



1. A nondispersive microwave antenna system comprising:

(a) antenna means for radiating a microwave beam which exhibits variation in the direction of propagation of said beam in a first plane with variation in the frequency of said beam;

(b) lens means for controllably deflecting the direction of propagation of said beam in said first plane, said lens means comprising a plurality of networks located one behind the other, each in the direction of propagation of said beam and each network comprising a plurality of portions with said portions comprising first means for conducting said first means for conducting being cut into sections, second means for conducting and a plurality of first means for switching having conductive and non-conductive states, said first means for switching being spaced apart on said second means for conducting to selectively render said second means for conducting discontinuous when said first means for switching is in said non-conductive state to assure a shift in the phase of said beam passing through said portions of said networks depending upon said conductive and non-conductive states of said first means for switching in said portions of said networks; and

(c) control means for setting the state of conduction of said first means for switching to establish phase shifts in said beam in said portions which phase shifts correct for said variation in the direction of propagation of said beam with variation in the frequency of said beam.

4,297,709

LUNEBERG LENS ANTENNA

Knut E. Cassel, and Bengt T. Molin, both of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1980, Ser. No. 114,490

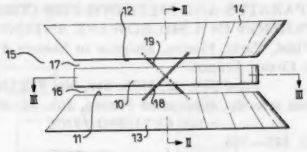
Claims priority, application Sweden, Feb. 6, 1979, 7901047

Int. Cl.[3] **H01Q** *15/08*

U.S. Cl. 343—754 **7 Claims**

1. An antenna comprising a round disc shaped lens element of the Luneberg type, having a radially varying diffraction index decreasing in the peripheral direction, surrounded on its planar sides by two conductive planes and having feeders distributed across at least a portion of the circumference, said feeders being shaped and oriented to transmit and receive, respectively, a polarized wave, the polarization direction of

which forms an angle less than 90° with the plane of the lens element, a substantial portion of the distance between the conductive planes external to said lens element being formed



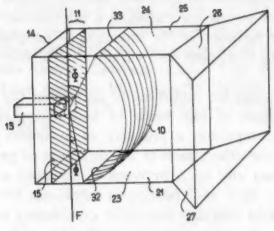
by a dielectric medium having the dielectric constant of air, the thickness of said medium being substantially constant across the lens.

4,297,710

PARALLEL-PLANE ANTENNA WITH ROTATION OF POLARIZATION

Albert Dupressoir, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 4, 1980, Ser. No. 127,097
Claims priority, application France, Mar. 9, 1979, 79 06135
Int. Cl.³ H01Q *19/195*
U.S. Cl. 343—756 **12 Claims**



1. A parallel-plane antenna comprising two parallel metal plates limited by a cylindrical-parabolic end-wall illuminated by a source, said source being placed on the focal line of said antenna at an equal distance from the two plates, at the rear of said antenna on the opposite side of the emitted wave and said cylindrical-parabolic end-wall comprising a semitransparent reflector and said plane at right angles to the plates and containing the focal line being formed by a polarizing reflector unit.

4,297,711

OMNIDIRECTIONAL RECEIVING ANTENNA

Hans Ekström, Mankkaanpuro 19, SF-02180 Espoo 18, Finland

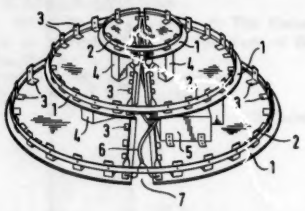
Filed Jul. 25, 1979, Ser. No. 60,368
Claims priority, application Finland, Jul. 31, 1978, 782364
Int. Cl.³ G08B *5/22*; G09F *9/00*
U.S. Cl. 343—794 **7 Claims**

1. An omnidirectional receiving antenna primarily for receiving TV signals comprising at least one substantially circular antenna element tuned to receive signals in a predetermined frequency range, said at least one element including

a substantially circular metal plate having means defining a slot extending along a diameter of the plate, said slot opening at one edge of the plate and extending to a terminus close to but spaced radially inwardly from the opposite edge;

an elongated metal band extending circularly around the periphery of said plate and across the open end of said slot, the end portions of said band being bent inwardly to form substantially straight symmetrical leg portions extending along the edges of said slot from bends therein on opposite sides of the slot opening;

means for connecting the distal ends of said leg portions to said plate adjacent said slot; and



means for mounting said band in axially spaced relationship from said plate;

an amplifier having input terminals connected to said end portions of said band; and

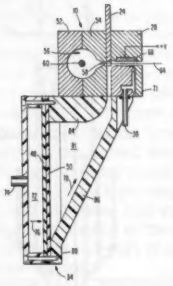
a housing for said antenna element.

4,297,712

AIR FLOW TUNNEL FOR REDUCING INK JET DRAG ON ARRAY HEAD

Gerald B. Lammers, Boulder, and Gordon J. Smith, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,093
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **13 Claims**



1. An integrated ink jet aspirator comprising:

a housing means having an air inlet port, an interconnecting flow channel and an outlet port;

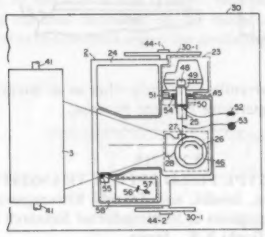
said interconnecting flow channel includes a first section operable to reduce turbulence in a stream of incoming air, a second section being coupled to the first section and operable to increase the velocity of the incoming air; a third section being coupled to the second section said third section having a noncircular cross section with a constant geometry along its longitudinal axis and operable to maintain a constant velocity in the incoming air; and

an ink jet head positioned relative to the housing means and in linear alignment with the third section whereby ink droplets emanating from the ink jet head are being propelled into a nonturbulent uniform velocity air flow.

4,297,713
LASER RECORDING APPARATUS

Junji Ichikawa; Nobuhiro Imai; Kimio Kohno; Koichi Kadokura, and Masaaki Ishii, all of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1979, Ser. No. 43,246
Claims priority, application Japan, Jun. 3, 1978, 53-66858; Sep. 21, 1978, 53-117237
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—108 **3 Claims**

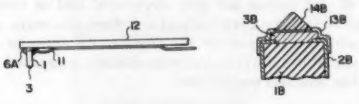


1. A laser recording apparatus, comprising:
laser means comprising a laser element for emitting a laser beam;
optical means supporting said laser means, said optical means receiving the laser beam therefrom at an entrance end and emitting a collimated laser from an exit end thereof, said optical means being provided with a mounting standard face, wherein the difference between the distance of the laser element from said standard face and the distance of the entrance end from said standard face are maintained within the focal depth of said optical means even in the presence of a temperature change;
a support member comprising a mounting standard face on which is affixed said mounting standard face of said optical means; and
deflector means for directly receiving the laser beam from said optical means and directing said laser beam toward a recording medium.

4,297,714
THERMAL PEN

Kazunari Ando, Tajimi; Hirokazu Matsunaga, Tsushima, and Hideaki Ayabe, Tokyo, all of Japan, assignors to Nippon Toki Kabushiki Kaisha, Nagoya and Watanabe Instruments Corp., Tokyo, both of, Japan

Continuation of Ser. No. 853,874, Nov. 22, 1977, abandoned. This application Aug. 30, 1979, Ser. No. 71,035
Claims priority, application Japan, Apr. 5, 1977, 52-42519[U]
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—139 C **8 Claims**

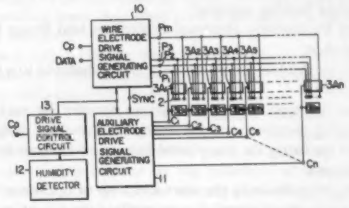


1. A thermal pen of the thick film type for thermal recording, comprising a thermal pen tip and a thermal pen tip holder connected to said thermal pen tip for holding the thermal pen tip, said thermal pen tip comprising a high resistance, low thermal-conductivity, planar substrate formed in the form of a pen point and having a rectangular cross section, a heater element in the form of a thick film having a flat top surface on a portion of the end surface of the pen point of said high resistance, low thermal-conductivity, planar substrate, a generally semispherically prefabricated minute recording piece having a flat bottom surface and made of a heat-resistant, wear-resistant material having a thermal-conductivity substantially equal to or higher than that of said substrate, said recording piece being attached at its flat bottom surface to a portion of said flat top surface of said heater element and being adapted to be heated by said heater element for performing the thermal recording, and an electrical conductor in the form of a thick film so as to connect to said heater element of the high resistance substrate, said thermal pen tip holder and said planar substrate arranged so that during said thermal recording said substrate moves in the direction of the longitudinal length of said rectangular cross section.

4,297,715
ELECTROSTATIC RECORDING APPARATUS

Masaharu Tadauchi; Kunio Sato, both of Hitachi, and Kiyohiko Tanno, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 54,273
Claims priority, application Japan, Jul. 14, 1978, 53-85162
Int. Cl.³ G11B *15/60;* **G01W** *1/02*
U.S. Cl. 346—150 **9 Claims**



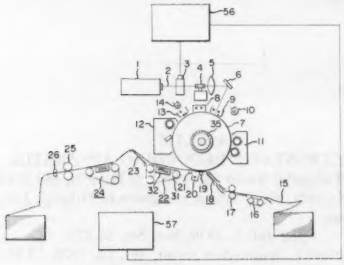
1. An electrostatic recording apparatus comprising:
a wire electrode row including a multiplicity of wire electrodes which are continuously arranged substantially in a row and are divided into a plurality of wire electrode blocks each having the same number of wire electrodes;
a plurality of auxiliary electrodes arranged along said wire electrode row and respectively in opposition to said plurality of wire electrode blocks;
a driving circuit for selectively applying driving signals to said wire electrodes and said auxiliary electrodes in response to a recording signal, said driving circuit simultaneously applying said driving signals to the corresponding wire electrodes of the respective wire electrode blocks;
an electrostatic recording medium disposed close to said wire electrodes and aid auxiliary electrodes, of which the portion close to both of the driven auxiliary electrode and the driven wire electrode opposite to the driven auxiliary electrode is charged thereby to have an electrostatic latent image thereon;
means for relatively moving said wire electrodes, said auxiliary electrodes and said recording medium;
a humidity detector for detecting ambient humidity thereby producing a signal representing a detected value;
control means for controlling a waveform of at least one of a drive signal applied to said wire electrode and a drive signal applied to said auxiliary electrode in accordance with the output signal from said humidity detector; and
means for developing said charged recording medium to obtain a visualized image without formation of a ghost image.

4,297,716

RECORDING APPARATUS INCLUDING A CONTINUOUS TRANSFER WEB

Kazuhiro Hirayama, Yokohama, and Susumu Sugiura, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 819,142, Jul. 26, 1977, abandoned. This application Aug. 21, 1979, Ser. No. 68,419
Claims priority, application Japan, Jul. 30, 1976, 51-91836
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—153.1 **16 Claims**



1. A recording apparatus comprising:
an image bearing member;
means for forming continual images on said image bearing member;
means for feeding a continuous transfer material to a transfer station;
means for transferring the images formed on said image bearing member onto the continuous transfer material;
means for fixing the transferred images on the transfer material; and
means, responsive to the start and stop of operation of said image forming means, for controlling the actuation of said feeding means, transferring means, and fixing means at different delayed times from each other to transfer a series of images from said image bearing member onto desired portions of said continuous transfer material irrespective of image location on said image bearing member.

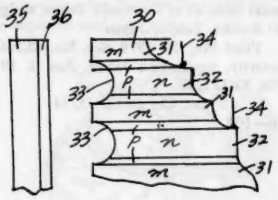
4,297,717

SEMICONDUCTOR DEVICE

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 7,584, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 764,433, Jan. 31, 1977, Pat. No. 4,136,435, which is a continuation-in-part of Ser. No. 405,138, Oct. 10, 1973, abandoned, which is a continuation of Ser. No. 190,483, Oct. 19, 1971, Pat. No. 3,765,956, Ser. No. 386,102, Aug. 6, 1973, and Ser. No. 802,018, Feb. 25, 1969, Pat. No. 3,500,135, which is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109, said Ser. No. 190,483, is a continuation-in-part of Ser. No. 868,129, Oct. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,718, Sep. 30, 1965, abandoned. This application Aug. 24, 1979, Ser. No. 69,298
Int. Cl.³ H01L *29/64*
U.S. Cl. 357—15 **17 Claims**

1. An active solid state structure comprising:
a metal substrate sheet and a layer of solid material adhered to the metal substrate sheet;
said solid material comprising a multiplicity of elongated bodies of a single crystal semiconductor device material spaced from each other by similarly elongated bodies of a metal, there being electronic barriers between said elongated bodies of the semiconductor material and elongated bodies of metal; and
said elongated bodies of semiconductor material and of a metal and said electronic barriers therebetween being



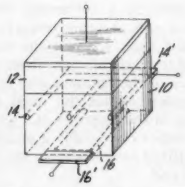
formed concurrently with each other as an integral structure by a temperature gradient process.

4,297,718

VERTICAL TYPE FIELD EFFECT TRANSISTOR

Jun-Ichi Nishizawa, Sendai, and Takashi Kitsuregawa, Itami, both of Japan, assignors to Semiconductor Research Foundation Mitsubishi Denki K.K., Japan

Continuation-in-part of Ser. No. 469,017, May 10, 1974, abandoned. This application Jun. 8, 1976, Ser. No. 693,894
Claims priority, application Japan, May 22, 1973, 48-58054
Int. Cl.³ H01L *29/80*
U.S. Cl. 357—22 **3 Claims**



1. A vertical type field effect transistor comprising a semiconductor substrate including a pair of main opposite faces, a source electrode, a gate electrode, and a drain electrode, at least one of said source, gate and drain electrodes being disposed on one of said main opposite faces, at least one of the remaining electrodes being disposed on the other main face of the substrate, an input terminal and an output terminal, wherein at least two highly doped semiconductor regions form respective ones of said electrodes and are formed elongated and slender and having a dimension and impurity concentration imparting thereto a low resistance in a direction of travel of an electromagnetic wave traveling therein to form a transmission line whereby the transistor performs in a traveling wave mode of operation, and wherein said transmission line includes a common line defined by one of said source and gate electrodes, an input line defined by said common line and the other of said source and gate electrodes, and an output line defined by said common line and said drain electrode, and said input and output terminals are disposed on opposite sides of said transistor substrate and respectively connected to said input line and said output line.

4,297,719

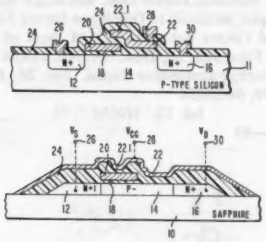
ELECTRICALLY PROGRAMMABLE CONTROL GATE INJECTED FLOATING GATE SOLID STATE MEMORY TRANSISTOR AND METHOD OF MAKING SAME

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 10, 1979, Ser. No. 65,436
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23 **11 Claims**

1. A non-volatile memory structure of the type including a

conductive floating gate storage device having a floating gate member for storing charge injected thereon, a conductive control gate member, a body of semiconductor material in which spaced drain and source regions of a first conductivity type are embedded at the surface thereof, the drain and source regions spaced a given distance one from the other to define a channel region of an opposite conductivity type therebetween, a drain-channel junction formed at the boundary of the drain and channel regions, a source-channel junction formed at the boundary of the source and channel regions, a first layer of insulating material deposited on the body of semiconductor material over the channel region for insulating the floating gate



member from the channel region, and a second layer of insulating material deposited on the floating gate member for insulating the floating gate member, the improvement comprising:

the floating gate member offset in the channel region in a direction toward the source region; and

a write-erase window portion located in a region of the control gate member, the window portion positioned over only a portion of the floating gate member and in closer proximity to the floating gate member than the remainder of the control gate member whereby charge is injected into the floating gate member solely from the window portion of the control gate member.

4,297,720

MULTI-PHOTODIODES

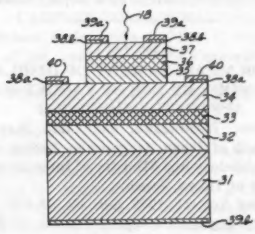
Hideaki Nishizawa, and Shin-Ichi Iguchi, both of Nishinomiya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 19, 1979, Ser. No. 59,118

Claims priority, application Japan, Jul. 21, 1978, 53-89690

Int. Cl.³ H01L *27/14, 29/161*

U.S. Cl. 357—30 **5 Claims**



1. Multi-photodiodes comprising a first photodiode, having a photo-sensitive region with a forbidden band-gap E_1, and a second photodiode, having a photo-sensitive region with a forbidden band-gap E_2, each photodiode consisting of p-n structures or p-i-n structures of semiconductor compounds, said first and second photodiodes integrated into one body with an intermediate connecting semiconductor compound layer of at least one of said photodiodes providing a filter layer having a forbidden band-gap E_3, said forbidden band-gaps E_1, E_2, and E_3 being under the condition of $E_1 < E_3 < E_2$.

4,297,721

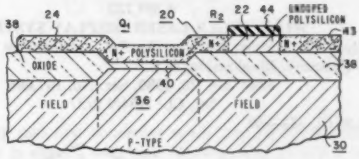
EXTREMELY LOW CURRENT LOAD DEVICE FOR INTEGRATED CIRCUIT

Vernon C. McKenny, and Tsiu C. Chan, both of Carrollton, Tex., assignors to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 957,587, Nov. 3, 1978, which is a continuation of Ser. No. 743,810, Nov. 22, 1976, abandoned. This application May 29, 1979, Ser. No. 43,419

Int. Cl.³ H01L *29/04*

U.S. Cl. 357—59 **10 Claims**



1. A semiconductive impedance structure comprising:

a substrate of monocrystalline semiconductor material;

an insulating layer deposited over a portion of a surface of said substrate;

a unitary body of substantially intrinsic polycrystalline semiconductor material disposed on a portion of said insulating layer defining a first conductive path;

A doped area of extrinsic impurities of a first conductivity type disposed within a first region of said unitary body defining a second conductive path, an intrinsic-extrinsic junction being defined by the interface of the extrinsic diffusion region within the unitary intrinsic body;

the first and second conductive paths defining a series electrical path for the flow of current through the intrinsic-extrinsic junction.

4,297,722

CERAMIC PACKAGE FOR SEMICONDUCTOR DEVICES HAVING METALIZED LEAD PATTERNS FORMED LIKE A FLOATING ISLAND

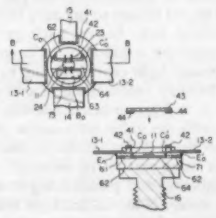
Tsutomu Nagahama, Kawasaki, and Michio Ishihara, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 18, 1979, Ser. No. 76,577

Claims priority, application Japan, Sep. 18, 1978, 53-127835[U]

Int. Cl.³ H01L *23/02, 23/12, 39/02*

U.S. Cl. 357—74 **6 Claims**



1. A transistor device comprising:

a first ceramic plate which is provided with an emitter lead, a base lead and a collector lead, these emitter, base and collector leads being formed as metallized layers on the plate and being electrically connected to the correspond-

ing base, emitter and collector areas of a transistor chip element which is also mounted on the first ceramic plate; and

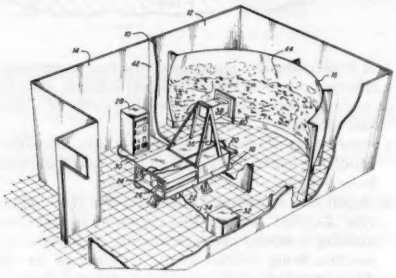
a second ceramic plate which is provided with an emitter guide lead, a base guide lead and a collector guide lead, these emitter, base and collector guide leads being formed as metallized layers on the plate and having corresponding emitter, base and collector lead terminals, respectively, wherein the emitter, base and collector leads of the first ceramic plate are electrically connected to the corresponding emitter, base and collector guide leads of the second ceramic plate, respectively, by means of respective conductive paths formed longitudinally along and on the side surface of the second ceramic plate.

4,297,723

WIDE ANGLE LASER DISPLAY SYSTEM

Clyde M. Whitby, Duncanville, Tex., assignor to The Singer Company, Binghamton, N.Y.

Filed Jan. 28, 1980, Ser. No. 107,686
Int. Cl.³ H04N 9/31
U.S. Cl. 358—60 **4 Claims**



1. A scanned light beam video display apparatus for use with a viewing surface, comprising:

(a) light means for providing three groups of light beams, each group comprising a plurality of beams of substantially monochromatic light such that the light of each group corresponds to a different one of the three primary colors;

(b) video means for providing three groups of video signals, each group comprising a plurality of primary color video channel signals, such that each group of signals corresponds to a different one of the three color video channels for a plurality of contiguous scene parts to be viewed;

(c) light modulation means associated with said light means and said video means and responsive to said three groups of video signals for intensity modulating said three groups of light beams in accordance with the video information contained in said signals to produce three groups of intensity modulated light beams, each group of modulated beams comprising a plurality of beams of substantially monochromatic light corresponding to a different one of the three primary colors, each of said plurality of beams within each said group being intensity modulated in accordance with the video information of one of the three color video channels for a different one of said plurality of contiguous scene parts to be viewed;

(d) light combining and parallelizing means for combining said three groups of modulated light beams such that each of said modulated beams corresponding to the channels of each one of said contiguous scene parts is combined so as to form composite beams of video intensity modulated light for raster scanning to form each of said contiguous scene parts, thereby producing a plurality of said composite beams in parallel relationship;

(e) single scanning means for scanning simultaneously said plurality of parallel composite beams in the pattern of a TV raster for each;

(f) projection means for projecting said plurality of raster scanned composite beams onto the viewing surface; and

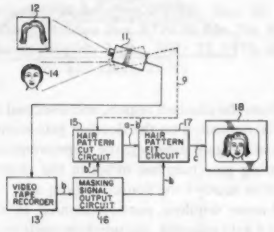
(g) beam separation means for spatially separating said projected plurality of raster scanned composite beams such that said separated beams raster scan said scene parts contiguously onto the viewing surface to form a single continuous scene.

4,297,724

METHOD AND MACHINE FOR TRYING ON A HAIR FORM IN IMAGE

Tatsunosuke Masuda; Yoshio Ono, and Seiya Sakamoto, all of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha and Takara Belmont Co., Ltd., both of, Japan

Filed Jan. 23, 1980, Ser. No. 114,947
Claims priority, application Japan, Jan. 24, 1979, 54-7375; Mar. 12, 1979, 54-28454
Int. Cl.³ H04M 7/18
U.S. Cl. 358—93 **11 Claims**



1. A method for trying on a hair form in image, comprising:

photographing a face shape and a hair pattern by a video camera to obtain first and second signals respectively corresponding to face shape and hair pattern;

preparing a third signal for masking the hair pattern portion in the face shape by using said second, hair pattern representing signal;

combining said third signals with said first signal so as to mask effectively the hair pattern portion of the face shape;

adding said second signal to the modified first signal so as to effectively add the hair pattern to partially masked face shape signal, thereby obtaining a fourth composite signal for making the face shape with the hair pattern thereon; and

displaying the fourth signal to generate a face shape with the desired hair pattern thereon in a display means.

4,297,725

METHOD FOR MEASUREMENT OF DISPLACEMENT OF MOVING BODY BY USE OF TARGET MARK AND APPARATUS THEREFOR

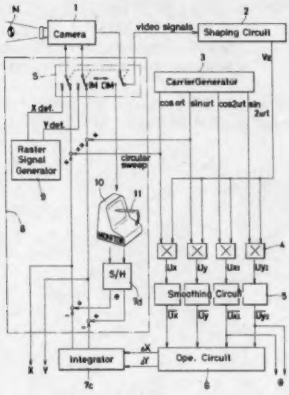
Ken-Ichi Shimizu, Tokorozawa, and Chuji Ikeya, Higashi-Murayama, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Aug. 21, 1979, Ser. No. 68,438
Claims priority, application Japan, Aug. 24, 1978, 53-103211
Int. Cl.³ H04N 7/18
U.S. Cl. 358—125 **6 Claims**

1. A method for the measurement of the displacement of a moving body by use of a target mark placed on the body, which target mark has two quarter shaded dark areas symmentrically opposed to each other, comprising the steps of:

(a) taking the image of the target mark with an image pickup tube by causing carriers for circular sweep to be respectively superposed on the relative deflection voltages, thereby to produce video signals;

(b) shaping an alternating current component of the video signals to produce a bistable video signal;
(c) subjecting said bistable video signal with each of said carriers and with sub-carriers having a frequency two times that of said carriers to synchronous rectification and smoothing, thereby to produce mean values ($\overline{U}_x$ and $\overline{U}_y$) for said carriers and mean values ($\overline{U}_{x2}$ and $\overline{U}_{y2}$) for said sub-carriers, the ratio of said mean values for the sub-carriers being equivalent to the angular displacement;
(d) calculating the deviation values (ΔX and ΔY) of the center of the target mark from the center of the circular sweep in accordance with the formulas:



$$\Delta X = \overline{U}_x \cdot \overline{U}_{x2} = \overline{U}_y \cdot \overline{U}_{y2}$$

$$\Delta Y = \overline{U}_x \cdot \overline{U}_{y2} = \overline{U}_y \cdot \overline{U}_{x2};$$

and

(e) feeding back to the deflecting system of the image pickup tube said deviation values as deflection-correcting voltages, thereby to cause the center of the circular sweep to coincide with that of the target mark, whereby the positional displacement of the target mark is determined on the basis of said deviation values and the angular displacement is determined on the basis of said mean values for the sub-carriers.

4,297,726

TELEVISION RECEIVER CHASSIS ADAPTED TO BE COMPATIBLE WITH DIFFERENT TUNER AND CABINET CONFIGURATIONS

John E. Nicholson, Indianapolis, and Paul C. Wilmarth, Noblesville, both of Ind., assignors to RCA Corporation, New York, N.Y.

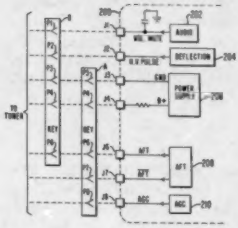
Filed Feb. 7, 1980, Ser. No. 114,872
Int. Cl.³ H04N 5/655
U.S. Cl. 358—254 **8 Claims**

1. A television receiver chassis containing television signal processing circuits including a plurality of different signal points, adapted for assembly with either a first or a second television receiver subsystem having different signal interface requirements with said chassis to form a television receiver, said first subsystem including a first connector coupled to the subsystem, said first connector including a first array of unblocked contact holes and one blocked contact hole, and said second subsystem including a second connector coupled to said second subsystem, said second connector including a second array of unblocked contact holes and one blocked contact hole; said television receiver chassis comprising:

an array of terminal locations, the number of said locations being equal to or greater than the number of contact holes in each connector, each of said locations being occupied by a terminal, with the exception of a blank terminal location which does not contain a terminal;

means for coupling said terminals to respective ones of said plurality of different signal points,

wherein a first combination of some of said terminal locations including said blank terminal location is capable of



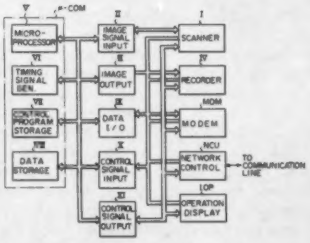
engaging said first connector when said blank terminal location is aligned with said blocked hole of said first connector, and wherein a second different combination of said terminal locations including said blank terminal location is capable of engaging said second connector when said blank terminal location is aligned with said blocked hole of said second connector.

4,297,727

FACSIMILE APPARATUS

Mutsuo Ogawa; Yuji Koseki; Yuichi Saitoh; Shingo Yamaguchi, and Shigeru Katsuragi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,466
Claims priority, application Japan, Jul. 9, 1979, 54-85826
Int. Cl.³ H04M 1/00
U.S. Cl. 358—261 **12 Claims**



1. A facsimile apparatus comprising:

scanner means;

recorder means;

microcomputer means having a central processing unit, a read only memory containing an operating program and a random access memory;

modem means;

first interface means connected between the scanner means and the microcomputer means;

second interface means connected between the microcomputer means and the modem means; and

third interface means connected between the microcomputer means and the recorder means;

in a transmission mode, the operating program controlling the microcomputer means to store image data from the scanner means in a first section of the random access memory through the first interface means, encode the data

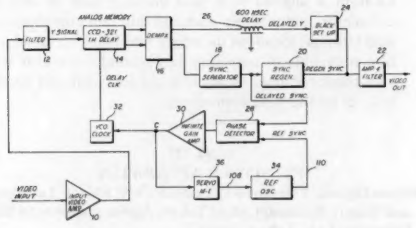
and store the encoded data in a second section of the random access memory and transfer the encoded data from the second section of the random access memory through the second interface means to the modem for transmission;

in a reception mode, the operating program controlling the microcomputer means to store encoded data received through the modem in the second section of the random access memory through the second interface means, decode the data and store the decoded data in the first section of the random access memory and transfer the decoded data from the first section of the random access memory through the third interface means to the recorder for producing a facsimile reproduction.

4,297,728
CHARGED COUPLED DEVICE TIME BASE CORRECTOR SYSTEM

Virgil L. Lowe, 1411 Noble Forest Dr., Norcross, Ga. 30092

Filed Apr. 6, 1979, Ser. No. 27,926
Int. Cl.³ H04N *5/04, 5/785*
U.S. Cl. 360—36 **6 Claims**



1. An analog video time base corrector system comprising:

input circuit means for receiving a video signal including synchronization information from a source, said input circuit means having an output;

analog delay line means coupled to said output of said input circuit means for delaying said video signal and said included synchronization information, said analog delay line means having first and second outputs;

first feedback circuit means coupled to the first output of said analog delay line means for controlling the delay thereof in response to said delayed synchronization information contained in said delayed video signal, said first feedback circuit means including an infinite gain phase detector means coupled to the first output of said delay line means for comparing the delayed synchronization information contained in said delayed video signal with a reference synchronization signal to detect the phase error in said delayed synchronization information, said phase detector means producing an output signal which is coupled through an infinite gain voltage amplifier to an input of a voltage controlled clock generator means, said clock generator means supplying a clock signal to a clock input of said delay line means, said clock signal having a frequency proportional to the phase error of said delayed synchronization information;

second feedback circuit means coupled to receive the output of said infinite gain voltage amplifier of said first feedback circuit means for supplying said reference synchronization signal to said first feedback circuit means, said second feedback circuit means including an adaptive time constant amplifier means coupled to receive the output of said infinite gain voltage amplifier for automatically controlling the response rate of said second feedback circuit means based upon the phase error of said synchronization information, said second feedback circuit means further including a first voltage controlled oscillator means coupled to receive the output of said adaptive amplifier means for generating said reference synchronization signal; and

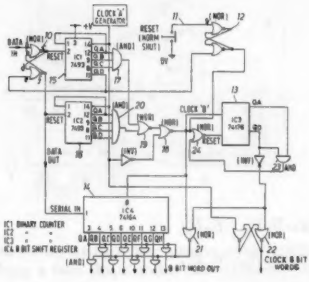
output circuit means coupled to the second output of said analog delay line means and coupled to receive said delayed synchronization information for interfacing the delayed output of said analog delay line means with circuitry external to said video time base corrector system;

whereby said system acts to slowly correct small phase errors and to rapidly correct large phase errors in synchronization timing such that a stable output video signal is produced for a wide range of input synchronization errors.

4,297,729
ENCODING AND DECODING OF DIGITAL RECORDINGS

James H. Steynor, High Wycombe, and Frederick Hayes, Southall, both of England, assignors to EMI Limited, Hayes, England

Filed Nov. 20, 1978, Ser. No. 961,933
Claims priority, application United Kingdom, Nov. 24, 1977, 48917/77
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—40 **11 Claims**



1. An arrangement for generating controlled clock pulses synchronized to a signal comprising a sequence of '1's, each indicated by the presence of a signal pulse and '0's each indicated by the absence of a signal pulse, so that in a sequence of consecutive '0's no signal pulses are present, the arrangement including a first counter receiving the said signal and arranged to count for a first predetermined period from a predetermined point in relation to each '1' of said signal and to provide a controlled clock pulse synchronized to said signal at the termination of the first period, a second counter arranged to count for a second and longer predetermined period from a preceding controlled clock pulse or until reset prior to the termination of said period and, if not reset, to provide at the termination of said second period a further controlled clock pulse and means for resetting the second counter on reception of a further '1' at the first counter.

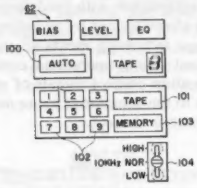
4,297,730
MAGNETIC RECORDING AND REPRODUCING DEVICE

Hidetaka Kadowaki; Akira Inomata; Kiyoshi Yanagida; Tsunao Hasegawa; Satoshi Ishii, and Yasushi Ohtake, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

PCT No. PCT/JP00051, § 371 Date Nov. 1, 1979, §102(e) Date Oct. 29, 1979, PCT Pub. No. WO79/00715, PCT Pub. Date Oct. 4, 1979.
This PCT application filed Nov. 1, 1979, Ser. No. 174,389
Int. Cl.³ G11B *5/47, 15/12*
U.S. Cl. 360—66 **11 Claims**

1. A magnetic recording and reproducing device comprising: means for setting an optimum recording bias current, said optimum recording bias current being set by varying a record-

ing bias current at arbitrary time intervals and digitally storing and operating reference recording/reproducing signals corresponding to the recording bias current thus varied; means for setting an optimum recording level, said optimum recording level being set by varying a recording level at arbitrary time intervals and comparing reference recording/reproducing signals corresponding to the record level thus varied with a reference level; and means for setting an optimum recording



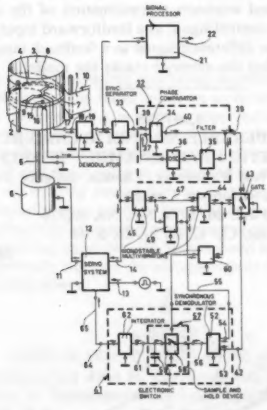
equalization characteristic, said optimum recording equalization characteristic being set by varying a recording equalization characteristic at arbitrary time intervals and comparing high frequency band reference recording/reproducing signals corresponding to the record equalization characteristic thus varied.

4,297,731

PLAYBACK APPARATUS FOR CORRECTING LOCKING ERRORS

Harald Melwisch, Vienna, Austria, and Hendrikus Looren de Jong, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 807,976, Jun. 20, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,019
Claims priority, application Austria, Jul. 30, 1976, 5674/76
Int. Cl.[3] G11B *27/10, 21/10*
U.S. Cl. 360—70 **4 Claims**



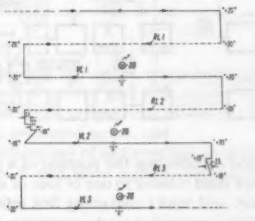
1. A tracking error detector for a playback apparatus having a rotary transducer with at least two magnetic heads whose effective gaps have mutually different azimuth angles for detecting television signals containing synchronizing pulses recorded on a record carrier in oblique signal tracks, said detector comprising means coupled to said magnetic heads for separating said synchronizing pulses from the detected television signal, means coupled to said separating means for detecting the phase shift between two consecutive synchronizing pulse trains each associated with a respective one of a pair of adjacent signal tracks and for supplying an output signal of a magnitude and polarity indicative of said phase shift which corresponds to the combined effects of tracking error and length variations of said record carrier, and means for removing from said output signal components due to length variations of said record carrier.

4,297,732

METHOD AND DEVICE FOR LOCATING A SOUND EVENT ON A MAGNETIC TAPE

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed May 25, 1979, Ser. No. 42,690
Claims priority, application Austria, Jun. 5, 1978, 4045/78
Int. Cl.[3] G11B *15/18, 19/02*
U.S. Cl. 360—72.1 **26 Claims**



1. A method for coordination of a location signal to a sound event stored on a magnetic tape in a magnetic tape device, particularly for ascertaining the precise location of the beginning and/or end of the sound event on the tape with respect to a reference point on the tape device, comprising the steps of

starting the playback of the tape which contains the sound event from a point before the sound event,

upon hearing the sound event activating a counter to set it to count condition zero and via the counter initiating a detectable location signal automatically when the counter is at the count condition zero and simultaneously causing the counter to count forward with counts of the counter being dependent on the length of tape being transported by the tape device,

subsequently reversing the magnetic tape to travel back at least to the sound event and causing the counter to count backwards dependent on the transported length of the tape in the reverse direction,

repeating playback of the tape together with operation of the counter to count forward, causing the location signal to occur automatically when the counter reaches the count condition zero and the sound event to occur when the sound event plays on the tape device,

perceiving and estimating the time relationship between the played back sound event and the occurring location signal,

changing a count condition of the counter based on the perceived and estimated time relationship between the sound event and the location signal so that a subsequent occurrence of the location signal is shifted vis-a-vis the played back sound event during a subsequently repeated playback step,

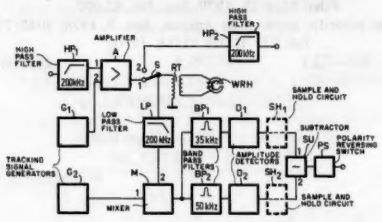
repeating the perception and estimation, changing, reversing and repeating playback steps so as to progressively shift the then occurring location signal vis-a-vis the then played back sound event until the location signal and the played back sound event are perceived as substantially concurrent by the user and are thereby correlated, and

positioning the sound event on the magnetic tape with respect to a reference point on the tape device using the correlated location signal.

4,297,733
METHOD OF CONTROLLING THE POSITION OF A WRITE OR READ HEAD AND A DEVICE FOR CARRYING OUT THE METHOD

Hendrik J. Sanderson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 880,437, Feb. 23, 1978, abandoned.
This application Apr. 1, 1980, Ser. No. 136,235
Claims priority, application Netherlands, Mar. 16, 1977, 7702815
Int. Cl.[3] G11B 5/52, 21/10
U.S. Cl. 360—77 6 Claims



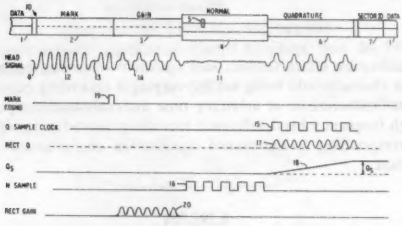
1. A method of detecting the position of a magnetic recording/playback head relative to one of four or more tracks on a record carrier, said tracks containing first information signals and at least four consecutive tracks containing second tracking signals having mutually different frequencies recorded therein in cyclic sequence, said frequencies of said tracking signals being different from frequencies of said information signals, said method comprising the steps of generating a third signal having a frequency which changes from track to track in relation to the frequency of said tracking signals such that, for a given pair of adjacent tracks, the frequency of the third signal associated with one track of said pair differs from the frequency of the tracking signal recorded on the other track of said pair by one of a first and second predetermined number of cycles which are different from each other, subtracting the frequency of said third signal associated with said one track from the frequencies of tracking signals in the tracks adjacent said one track to produce a pair of fourth signals each having a frequency corresponding to said first and second number of cycles, respectively, and obtaining from said pair of fourth signals a resultant signal indicative of displacement of said head from the track being read.

4,297,734
SAMPLED DATA SERVO POSITIONING SYSTEM

William J. Laishley, and John R. Taylor, both of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,120
Claims priority, application United Kingdom, Dec. 27, 1978, 49980/78
Int. Cl.[3] G11B 21/08, 21/10
U.S. Cl. 360—78 13 Claims

1. A sampled data servo positioning system for moving a member between a current and a target position comprising:
- an actuator responsive to applied drive signals to move such a member;
- a position transducer movable with the member for producing signals in response to motion thereof;
- position signal generating means responsive to the position transducer signals to produce at least one incremental position signal representative of the position of the member at sampling times;
- a model responsive to an input signal to produce at least one continually available model incremental position signal;
- profile signal generating means for generating a profile signal, corresponding to a predetermined velocity profile, as an input signal for the model;
- phase comparing means for comparing and indicating the phase difference between the sampled and model position signals at the sampling times;
- actuator feedforward signal generating means for generating a feedforward control signal for the actuator corresponding to the predetermined velocity profile;
- and stage indicating means for indicating various stages of the motion in accordance with predetermined conditions;
- the system being characterized by switching means responsive to the stage indicating means to switch the system between first and second operational configurations, by a source of saturation control signals of opposite polarity for application to the actuator to cause maximum acceleration or deceleration thereof,

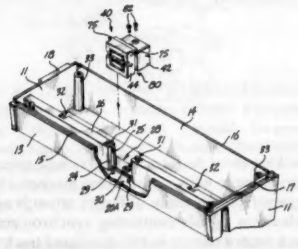


- and by means for deriving a continuous performance signal representative of actuator motion; and wherein, in the first operational configuration, the switching means connects the saturation control signal source to the actuator and connects a combination of the actuator performance signal as a feedforward input and the position phase difference signal as a feedback input to the model so that the model tracks the actuator system,
- and wherein, in the second operational configuration, the switching means connects the model input profile signal to the model, and connects a combination of the actuator feedforward control signal as a feedforward input and the position phase difference signal as a feedback input to the actuator so that the actuator tracks the model.

4,297,735
MANUALLY OPERABLE MAGNETIC CARD READER AND MAGNETIC HEAD ASSEMBLY THEREFOR

Helmut Eppich, West Vancouver, Canada, assignor to EBCO Industries, Ltd., Richmond, Canada

Filed Jul. 26, 1979, Ser. No. 60,776
Int. Cl.[3] G11B 21/20, 5/48
U.S. Cl. 360—104 24 Claims



1. For use in a magnetic card reader which includes a housing defining a housing slot through which a card is manually moved, by grasping the card and sliding the card along the housing slot, to effect reading of data magnetically recorded

on the card, a magnetic head assembly separate from the housing and comprising:

block means having formed therein a block slot through which the card passes as the card is manually moved through the housing slot, and also having formed therein first and second apertures extending into said block means from said block slot and opposing each other across said block slot;

a magnetic reading head in said first aperture and a pressure pad in said second aperture, and separate means respectively mounting said magnetic reading head and said pressure pad in there respective apertures for reciprocal motion therein to and from said block slot; and

means yieldably biasing said magnetic reading head and said pressure pad toward said block slot.

4,297,736

DEVICE FOR ADJUSTING AND FIXING DETECTING MEANS RELATIVE TO THE INDEX MARK ON A RECORDING DISC

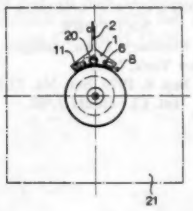
Klaus Manzke, Westheim; Roland Brotzler, Hochdorf-Assenheim, and Klaus Schulze-Berge, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 27, 1979, Ser. No. 106,891

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 7900696[U]

Int. Cl.³ G11B *7/08, 17/00, 3/86*

U.S. Cl. 360—109 **3 Claims**



1. A device for adjusting and fixing an index-mark-detecting means relative to the index mark on a recording disc, which device is arranged on a recording/reproducing apparatus for the recording disc and comprises a holding device for a detecting means, the position of which can be altered and which can be aligned and fixed relative to the index mark on the disc, wherein the holding device for the detecting means is a slidably mounted member which has at least one elongated hole and is spring-loaded against the chassis of the apparatus, said member moving on an arcuate path defined by the curved line passing centrally through the elongated hole and the middle of the detecting means.

4,297,737

SECTOR SERVO WITH SYNC MARKS

Rolf Andresen, and John H. Christian, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,104

Int. Cl.³ G11B *5/82, 21/10*

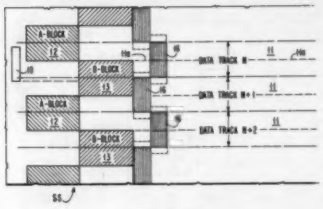
U.S. Cl. 360—135 **5 Claims**

1. A track following disk file including a record storage disk having a plurality of circumferentially spaced apart servo signal sectors, each sector having servo signals identifying a data track location line for track following, said data track locations containing recorded data signals, each of said servo sectors for each of said data track locations lines including a sync signal recorded adjacent a trailing edge of a servo signal and centered on said data track location line,

each said sync signal including recorded information relative to the validity of the servo signals in its associated sector,

transducing means for reproducing said servo signals, said sync signals and said data signals,

means for separating said sync signals from said reproduced signals,



means operative only during the approximate time interval of occurrence of each of said sync signals for decoding each said sync signal to determine the validity of the servo signals in its associated sector, and

means for modifying any of said sync signals indicating valid servo signals if said servo signals subsequently become invalid.

4,297,738

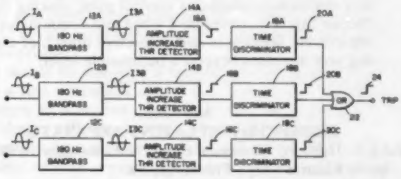
APPARATUS FOR AND METHOD OF DETECTING HIGH IMPEDANCE FAULTS ON DISTRIBUTION CIRCUITS WITH DELTA CONNECTED LOADS

Ilyoul Lee, Pacific Palisades, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 29, 1979, Ser. No. 89,202

Int. Cl.³ H02H *3/16*

U.S. Cl. 361—42 **6 Claims**

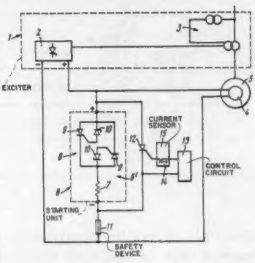


1. A device for use in detecting high impedance faults in a three-phase distribution circuit with delta connected load, said device comprising first means for providing the third harmonic current component from each three phase line current of said distribution circuit, second means connected with said first means for sensing the presence of a predetermined minimum increase in amplitude in each of said third harmonic components, and third means connected with said second means for producing a signal in response to the presence of said increase in any one of said components for a continuous predetermined period of time, said signal indicating a high impedance fault in the line carrying said one component.

4,297,739
DEVICE FOR EXCITING SYNCHRONOUS MACHINE

Rodion G. Goldin, ulitsa Mamina-Sibiryaka, 8, kv. 56, and Valentin G. Yakimenko, ulitsa Taganskaya, 48, kv. 89, both of Sverdlovsk, U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,177
Int. Cl.[3] H02H *7/06, 7/09*
U.S. Cl. 361—55 **4 Claims**



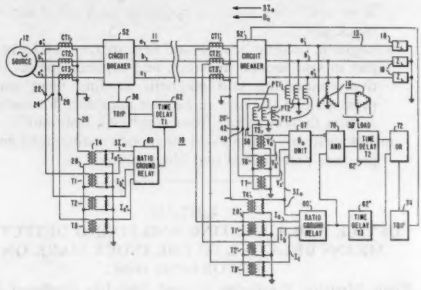
1. A device for exciting a synchronous machine, comprising:
an exciter electrically connected to an exciting winding of said synchronous machine;
a starting unit connected parallel to said exciter and comprising at least one branch composed of a resistor and a thyristor switch placed in series, each branch protecting said exciting winding of said synchronous machine and said exciter against overvoltages during transient operation conditions; and a control circuit of said thyristor switch including voltage actuated threshold elements making thyristors of said thyristor switch conductive in order to activate said branch when voltage in said exciting winding exceeds the setting of said threshold element;
at least one safety device connected in series in the circuit of a respective branch of the starting unit and disconnecting said respective branch in case of a fault in said respective branch;
at least one protective thyristor connected parallel to a respective branch of the starting unit to bypass said respective branch in case of a fault in said respective branch;
at least one current sensor of a respective branch of the starting unit connected in said respective branch and having a delayed-action commutator;
at least one control circuit of a respective protective thyristor connected to a control electrode of said respective protective thyristor via a respective delayed-action commutator of said sensor, said control circuit of said protective thyristor producing a control pulse making the protective thyristor conductive when said commutator closes the current flowing in said respective branch of the starting unit increases beyond a permissible level.

4,297,740
PROTECTIVE RELAYING APPARATUS

John E. Hagberg, Mountain Lakes, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1979, Ser. No. 9,012
Int. Cl.[3] H02H *3/28*
U.S. Cl. 361—67 **8 Claims**

1. Protective relaying apparatus for detecting and clearing high impedance faults on a polyphase electrical distribution circuit, comprising:
a polyphase source of alternating potential,
a polyphase distribution circuit,
a load circuit,
a first circuit breaker for controlling the connection of the distribution circuit to the source,
a second circuit breaker for controlling the connection of the distribution circuit to the load circuit,
first and second ratio ground relays at the first and second circuit breakers, respectively, for tripping the associated circuit breaker after a predetermined delay time when the ratio of zero sequence current to a predetermined phase current related quantity indicates a fault condition,

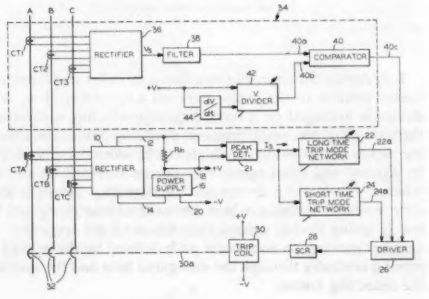


and a zero sequence directional relay at the second circuit breaker for coordinating the first and second ratio ground relays by adjusting the trip delay time of the second circuit breaker relative to the trip delay time of the first circuit breaker, in response to the flow direction of a zero sequence quantity at the second circuit breaker.

4,297,741
RATE SENSING INSTANTANEOUS TRIP MODE NETWORK

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 72,374
Int. Cl.[3] H02H *3/08*
U.S. Cl. 361—93 **10 Claims**



1. For protecting an AC electrical power distribution circuit against high level fault currents, an instantaneous trip mode network comprising, in combination:
A. a separate air-core current transformer linked with each phase conductor of the distribution circuit and including a multi-turn secondary winding in which is developed a sinusoidal secondary voltage signal proportional to the rate of change of the phase current flowing in the linked phase conductor;
B. a diode rectifying network connected with said secondary winding of each said air-core transformer for developing a rectified voltage signal corresponding to the one of said secondary voltage signals having the greatest magnitude;
C. a signal input circuit connected to receive said rectified voltage signal, said circuit including
(1) an input lead on which appears a voltage input signal proportional to said rectified voltage signal,

(2) capacitance means connected with said input lead for filtering from said voltage input signal spurious, short duration, high amplitude voltage spikes which are not indicative of ultimate phase current peak amplitude, and

(3) said input circuit affording effective charging and discharging current paths for said capacitance means such that said voltage input signal constitutes a rectified sinusoidal wave continuously reflecting the rate of change of that one of the phase currents having the greatest magnitude;

D. detector means connected with said input lead to receive said voltage input signal and operating to issue a circuit breaker trip initiating signal when said voltage input signal achieves a pre-selected threshold voltage level, whereby to predicate circuit breaker tripping solely on the change of phase current with respect to time exceeding a pre-selected rate.

4,297,742

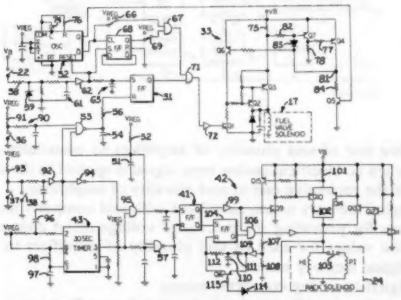
ENGINE AND FUEL SHUTDOWN CONTROL

Gary N. Heitzman, Washington; Clay L. Hutchings, Pekin; Gary L. Knepp, Eureka, and Robert G. Miller, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 823,770, Aug. 11, 1977, Pat. No. 4,150,654. This application Jan. 8, 1979, Ser. No. 1,816

Int. Cl.³ H01H *47/04*

U.S. Cl. 361—154 **30 Claims**



1. Apparatus for controlling solenoid operation comprising:

a solenoid,

a source of electrical energy,

a control switch having an operative position,

a settable and resettable latch means,

means for setting said latch means in response to movement of said control switch to its operative position,

means for connecting said solenoid to said source of electrical energy in response to movement of said control switch to its operative position and for supplying full current to said solenoid from said source for a desired period of time following such switch movement,

means for automatically reducing the level of current flowing from said source to said solenoid at the end of said desired period of time and for maintaining said reduced-level current to said solenoid for as long as said latch means is set,

means for resetting said latch means and for thereby terminating the flow of current from said source to said solenoid.

4,297,743

CALL AND STACK MECHANISM FOR PROCEDURES EXECUTING IN DIFFERENT RINGS

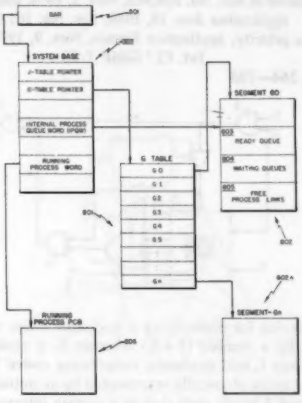
Marc Appell, Paris; Jean-Louis Bogaert, Clamart; Claude Massuard, Paris; John Bradley, Garches, all of France, and Benjamin S. Franklin, Cambridge, Mass., assignors to Compagnie Honeywell Bull, Paris, France

Continuation of Ser. No. 529,019, Dec. 2, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,814

Claims priority, application France, Nov. 30, 1973, 73 42705

Int. Cl.³ G06F *9/46*

U.S. Cl. 364—200 **32 Claims**



1. In combination with an automatic data processing apparatus comprising a virtual memory having a plurality of segments, each of some of said segments storing one of a plurality of procedures to be executed by said automatic data processing apparatus with privilege protection between said procedures, a central processing unit (CPU) connectable with said virtual memory to transfer data to and from said virtual memory, said CPU for processing information under control of a selected one of said plurality of procedures, each of said plurality of procedures having at least one level of privilege, said CPU having a plurality of registers for indicating the state of said selected procedure currently in control of said CPU, said virtual memory further having a push-down store for storing a plurality of different types of groups of information in stacks wherein the last group of information stored is the top of the stack, said groups of information being accessed in last-in-first-out fashion, each of said stacks being included within a uniquely addressable space bounded by one of said plurality of segments having adjustable bounds; a procedure call mechanism comprising:

(a) first means for initiating a transfer of control of said CPU from a first procedure stored in a first of said plurality of segments to a second of said plurality of procedures, by providing a call signal to said second procedure;

(b) second means responsive to said call signal for defining a plurality of data organizations, each of said data organizations having a predetermined format and being associated with a corresponding one of said plurality of procedures to receive data facilitating the transfer of control of said CPU from said first, calling procedure to said second, called procedure;

(c) third means responsive to the level of privilege of a procedure for stacking said data organizations of said procedure into said push-down store of said virtual memory in a manner such that each of said stacks of data organizations is bounded by a predetermined one of said plurality of segments, said predetermined segment being classified with a level of privilege; and

(d) and fourth means for identifying and storing the first loca-

tion of a top-most stack of data organizations in said push-down store.

4,297,744

PROCESS AND DEVICE FOR MULTIPLYING A STOCHASTIC VALUE BY A COEFFICIENT GREATER THAN THE UNIT

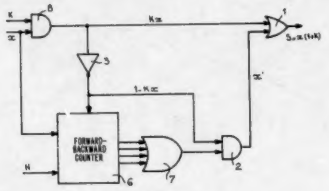
Jean-Claude Hoffmann; Francis Castanie, both of Toulouse; Henri Crabere, L'Union; Jean-Pierre Verdier, Cazeres, and Norbert Voisin, Bruguieres, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Continuation of Ser. No. 956,963, Nov. 2, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 161,009

Claims priority, application France, Nov. 9, 1977, 77 33777

Int. Cl.³ G06F *7/70*

U.S. Cl. 364—703 **11 Claims**



3. A device for multiplying a stochastic value x not greater than 0.5 by a number (1+K) wherein K is positive and not greater than 1, said stochastic value being coded by a random noise and being physically represented by an initial sequence of logic **0** and **1** levels such that in a certain interval of time, N logic **1** levels appear, comprising:

first means for forming, from said initial sequence representing x, a first auxiliary sequence comprising KN logic **1** levels;

second means for forming, from said initial sequence representing x, a second auxiliary sequence comprising N logic **1** levels, wherein each of said N logic **1** levels of said second auxiliary sequence occurs during a logic **0** level of said first auxiliary sequence; and

means for adding said first and second auxiliary sequences.

4,297,745

GAIN RANGING AMPLIFIER

James E. Layton, Ochelata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,903

Int. Cl.³ G01V *1/22*; H03F *1/02*

U.S. Cl. 367—66 **10 Claims**

1. In a seismic system for geophysical exploration comprising:

a plurality of remote geophone monitoring means, each of said remote geophone monitoring means being adapted to receive electrical signals from at least one geophone means; and

a central control means for generating electrical signals for initiating the operation of said plurality of remote geophone means;

each of said plurality of remote geophone monitoring means comprising:

a gain ranging amplifier means having a plurality of amplifiers for compressing the dynamic range of electrical analog signals;

means for converting the compressed electrical analog signals into digital seismic data; and

means for transmitting said digital seismic data to said central control means;

said central control means comprising:

means for transmitting commands to said plurality of remote geophone monitoring means; and

means for receiving data from said plurality of remote geophone monitoring means;

the improvement comprising:

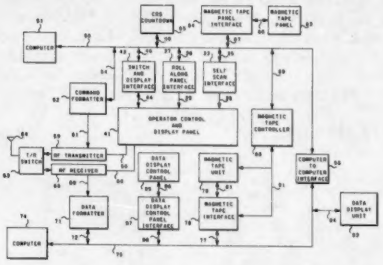
means for grounding the input of each one of said plurality of amplifiers for which a voltage offset compensation value is to be calculated;

an analog-to-digital conversion means;

a computer means;

means for providing the output of each one of said plurality of amplifiers, having the inputs thereof grounded, to said analog-to-digital conversion means to therein convert the output of said plurality of amplifiers to digital form;

means for providing the digital output of said analog-to-digital conversion means to said computer means to therein calculate a voltage offset compensation value for each of said plurality of amplifiers for which it is desired to calculate a voltage offset compensation value, each voltage offset compensation value having a voltage level which, if applied to the input of a respective one of said plurality of amplifiers for which the particular voltage offset compensation value was calculated, would drive the output signal from the respective one of said plurality of amplifiers to essentially zero when no electrical analog input signal is applied to the input of the respective one of said plurality of amplifiers;



a digital memory means associated with said computer means;

means for providing the calculated voltage offset compensation values for each of said plurality of amplifiers to said digital memory means;

a digital-to-analog converter means;

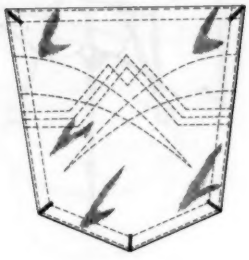
means for providing said calculated voltage offset compensation values from said digital memory means to said digital-to-analog converter means; and

means for providing the particular voltage offset compensation value determined for a particular one of said plurality of amplifiers from said digital-to-analog converter means to that particular one of said plurality of amplifiers, said calculated voltage offset compensation values being transferred from said digital memory means to said digital-to-analog converter means when electrical analog input signals are applied to the input of at least one of said plurality of amplifiers and the particular voltage offset compensation value determined for a particular one of said plurality of amplifiers being transferred from said digital-to-analog converter means to that particular one of said plurality of amplifiers when an electrical analog input signal is applied to the input of that particular one of said plurality of amplifiers to thereby substantially reduce errors caused by voltage offset.

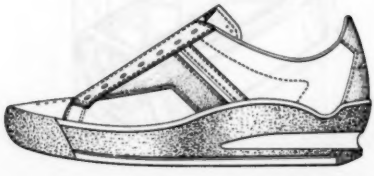
DESIGNS

OCTOBER 27, 1981

261,445
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Jan. 29, 1980, Ser. No. 116,426
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25

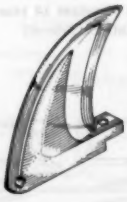


261,446
SHOE
Michael W. Schmohl, Nuremberg, Fed. Rep. of Germany, assignor to Uniroyal GmbH, Aachen, Fed. Rep. of Germany
Filed May 26, 1978, Ser. No. 909,878
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 7736457[U]
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



261,447
WORKMAN'S VEST
Matti Viio, Box 563, 191 05 Sollentuna, Sweden
Filed May 2, 1978, Ser. No. 902,153
Claims priority, application Sweden, Nov. 2, 1977, 2223
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—190

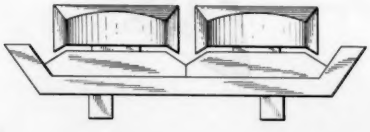
261,448
KEY RING ORNAMENT
Frank M. Liebscher, 298 Live Oak Rd., Watsonville, Calif. 95076
Filed Apr. 18, 1979, Ser. No. 31,071
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—65



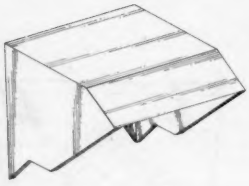
261,449
COUNTER DISPLAY STAND
Sydney Edson, East Meadow, N.Y., assignor to Howard Displays, Inc., New York, N.Y.
Filed Apr. 18, 1979, Ser. No. 31,081
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—23

261,450
PORTABLE SEAT
Robert J. Jenkins, 5806 Georgia, Kansas City, Kans. 66104
Filed Oct. 13, 1978, Ser. No. 951,065
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

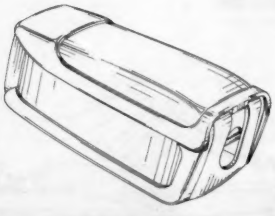
261,451
SOFA
Ramon R. Albert, 630 NW. 7th Ave., Homestead, Fla. 33030
Filed Feb. 6, 1978, Ser. No. 875,581
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



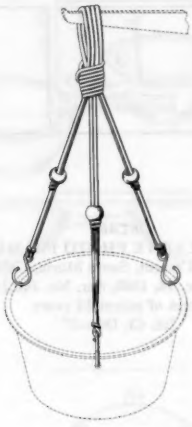
261,452
TOILET TISSUE COVER
Marlene Y. Chandler, 3174 Forest Manor, Indianapolis, Ind. 46218
Filed Oct. 26, 1979, Ser. No. 88,547
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86



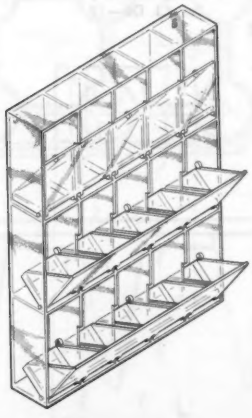
261,453
COMBINED HOLDER AND DISPENSER FOR COLLAPSIBLE TUBES
Daniel L. Pool, 4414 E. Lincoln Dr., Paradise Valley, Ariz. 85253
Filed Nov. 30, 1979, Ser. No. 98,810
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D6—87



261,454
POTTED PLANT HANGER
William Hobrecht, Brockton, Mass., assignor to New England Pottery Co., Stoughton, Mass.
Filed Sep. 24, 1979, Ser. No. 78,652
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—113



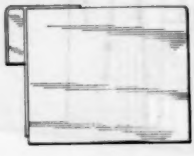
261,455
SPICE RACK
Carl H. Ewert, 1201 Monument Blvd., Apartment #76, Concord, Calif. 94520
Filed Aug. 9, 1979, Ser. No. 65,055
Term of patent 14 years
Int. Cl. D06—*04;* D07—*07*
U.S. Cl. D6—130



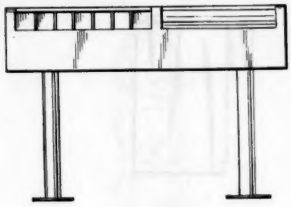
261,456
SERVICE COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,305
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

261,457
SERVICE COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,311
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

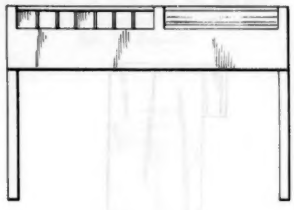
261,458
TELLER COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,944, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,415
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



261,459
DESK
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,941, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,422
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

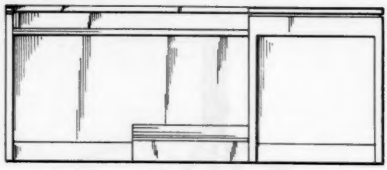


261,460
DESK
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,941, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,491
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

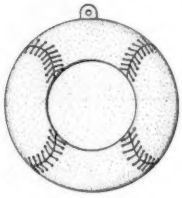


261,461
SERVICE COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,304
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

261,462
SERVICE COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,416
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

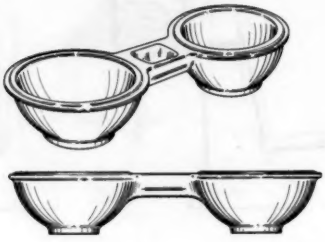


261,463
SIMULATIVE PHOTO FRAME
Nick P. Martin, 438 Cresent, Santa Maria, Calif. 93454
Filed Apr. 14, 1980, Ser. No. 140,232
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—243

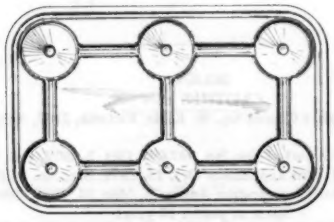


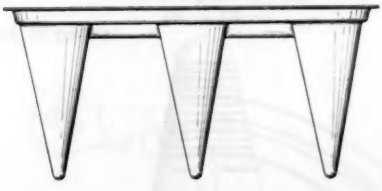
261,464
COMBINATION BEACH TOWEL-CARRY BAG
Allan B. Smith, 31 Bathurst St., Woollahra, N.S.W. 2025, Australia
Filed Aug. 14, 1978, Ser. No. 933,650
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—265

261,465
SERVING BOWL
Scott R. Minchew, 3778 Hillandale, Toledo, Ohio 43606
Filed Nov. 23, 1979, Ser. No. 96,844
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—19

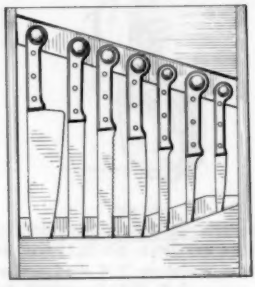


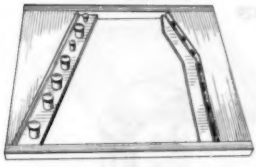
261,466
ICE CREAM CONE SERVING TRAY
Russell W. Harper, Oak Brook, Ill., assignor to Maryland Cup Corporation, Owings Mills, Md.
Filed Aug. 13, 1979, Ser. No. 66,294
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38



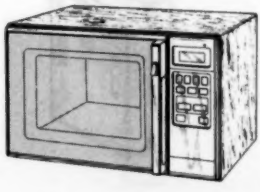


261,467
COMBINED KNIFE SET AND RACK
Paul P. Alessandrini, and Anna M. Alessandrini, both of 215-55 26th Ave., Bayside, N.Y. 11360
Filed Sep. 21, 1979, Ser. No. 77,619
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—74





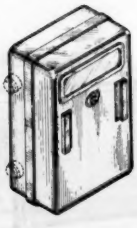
261,468
MICROWAVE OVEN
Yoichi Takahashi, Kouriyama; Mashimichi Yamamura, Osaka; Toshio Harada, and Shigefumi Inoue, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 17, 1979, Ser. No. 76,006
Claims priority, application Japan, Mar. 16, 1979, 54-10693
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



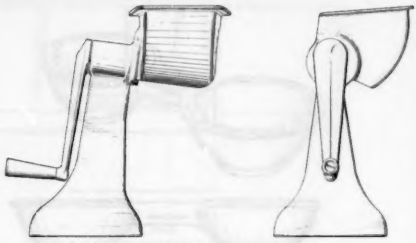
261,469
COMBINED ROTISSERIE MOTOR AND EXTENDED LIGHT
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Apr. 2, 1979, Ser. No. 25,789
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

261,470
COMBINED ROTISSERIE MOTOR AND LIGHT
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Apr. 2, 1979, Ser. No. 26,034
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

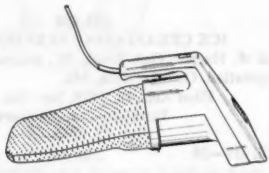
261,471
COMBINED ROTISSERIE MOTOR AND LIGHT
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 31, 1979, Ser. No. 108,563
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129



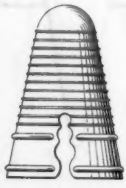
261,472
FOOD CUTTER
Elwood M. Graham, Ocean Springs, Miss., and John Polivka, Ocean Side, Calif., assignors to M. H. Graham Corporation, Biloxi, Miss.
Filed Mar. 2, 1979, Ser. No. 16,777
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—155



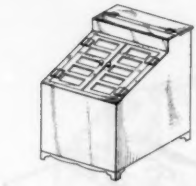
261,473
SUCTION BRUSH
Niklaus Hug, Romanshorn, Switzerland, assignor to Rommag P. Wörwag & Co., Romanshorn, Switzerland
Filed Jun. 12, 1979, Ser. No. 47,923
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 1218
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—18



261,474
CLOTHES PIN
Clive E. Joseph, 1 Church Sq., St. Kilda, Victoria, 3182, Australia
Continuation-in-part of Ser. No. 947,697, Oct. 2, 1978, Pat. No. Des. 256,539. This application Oct. 15, 1979, Ser. No. 84,677
Claims priority, application Australia, May 31, 1979, 78011
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—61



261,475
WOOD BOX
Raymond Wolfe, R.R. #1, Box 198, Farmland, Ind. 47340
Filed Jun. 25, 1979, Ser. No. 51,992
Term of patent 14 years
Int. Cl. D7—*07;* D6—*04*
U.S. Cl. D7—212

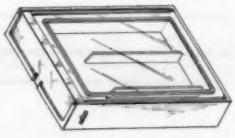


261,476
WELDING GUN
Thomas P. O'Donnell, Wheaton, Ill., and James A. Howery, Menomonee Falls, Wis., assignors to C-R-O, Inc., Menomonee Falls, Wis.
Filed Aug. 30, 1979, Ser. No. 69,721
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

261,477
CABLE OR RIVET CUTTER
Frank E. Shaffer, P.O. Box 1546, Costa Mesa, Calif. 92626
Filed Apr. 16, 1979, Ser. No. 29,994
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

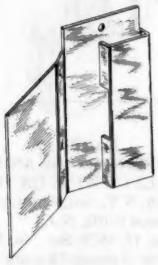
261,478
TAMPER PROOF STRIKER PLATE
William P. Gauntt, P.O. Box 744, Teague, Tex. 75860
Filed Aug. 20, 1979, Ser. No. 67,831
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—344

261,479
COMBINED SHIPPING, STORAGE AND SERVING UNIT FOR BOTTLES OF WINE OR THE LIKE
Philip Marks, New York, N.Y., assignor to Advertising Displays Corporation, Englewood Cliffs, N.J.
Filed Jan. 15, 1979, Ser. No. 3,686
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



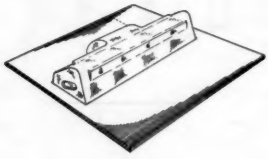
261,480
COMBINED COSMETIC CONTAINER AND ABRADER
Jana Lowenthal, 8029 Willow Glen Dr., Los Angeles, Calif. 90046
Continuation of Ser. No. 841,330, Nov. 31, 1977. This application Feb. 11, 1980, Ser. No. 120,723
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—314

261,481
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,266
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

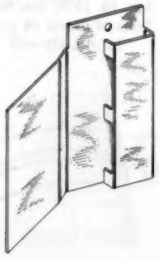


261,482
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,267
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

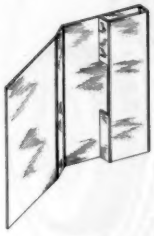
261,483
COMBINED DISPLAY AND PACKAGING CONTAINER FOR A SHAVING UNIT
Donald Thorpe, Madison, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 18, 1979, Ser. No. 49,685
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—342



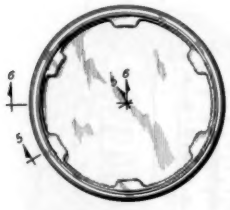
261,484
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,268
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



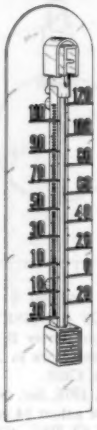
261,485
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,269
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



261,486
CONTAINER CLOSURE OR SIMILAR ARTICLE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Co., Bartlesville, Okla.
Filed Sep. 5, 1979, Ser. No. 72,754
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—452



261,487
THERMOMETER
Yoshiharu Kohno, Suita, Japan, assignor to Kohno Plastic Co., Ltd., Osaka, Japan
Filed Dec. 11, 1979, Ser. No. 102,451
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—58

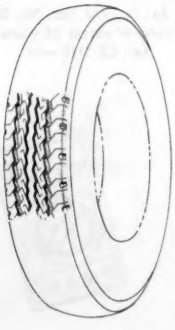


261,488
MULTIMETER
James R. Lindsay, Yorba Linda, and Gene D. Vedder, Reseda, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jul. 9, 1979, Ser. No. 55,940
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

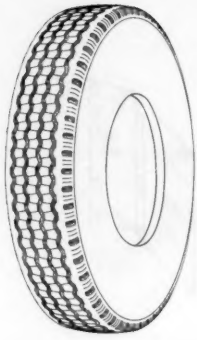
261,489
REFLECTOR
Arthur E. DuBois, Box 707, Dennisport, Mass. 02639
Filed Dec. 7, 1978, Ser. No. 967,230
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

261,490
FIGURINE OF A BASSET HOUND
Jesus A. S. Carbajales, and Javier B. S. Carbajales, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 29, 1978, Ser. No. 946,847
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

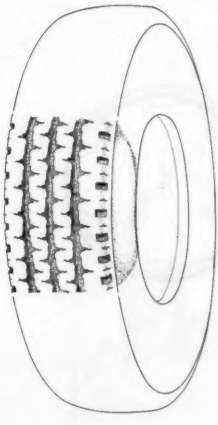
261,491
TIRE TREAD AND BUTTRESS
Philip S. Hammond, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 16, 1979, Ser. No. 21,138
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



261,492
TIRE
Raymond M. Remy, Capellen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 8, 1979, Ser. No. 1,634
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



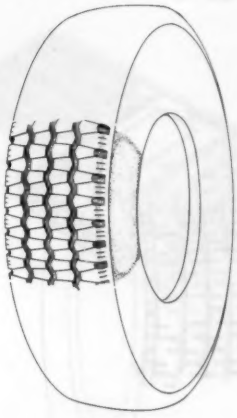
261,493
TIRE
Andre E. J. Baus, Colmar-Berg, Luxembourg, and Robert E. L. A. Pair, Arlon, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 8, 1979, Ser. No. 1,987
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



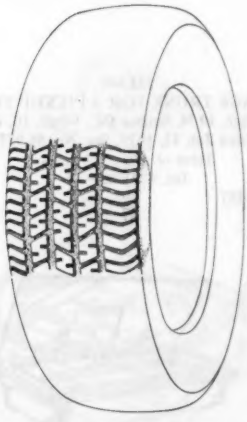
261,494
VEHICLE TIRE
Norio Suzuki, Kodaira, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Apr. 3, 1979, Ser. No. 26,708
Claims priority, application Japan, Jan. 31, 1979, 542969
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

261,495
TIRE TREAD AND BUTTRESS
Charles G. Yurkovich, Boardman, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 30, 1979, Ser. No. 34,703
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

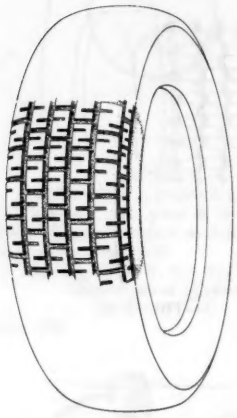
261,496
TIRE
Raymond M. Remy, Capellen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 8, 1979, Ser. No. 1,635
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



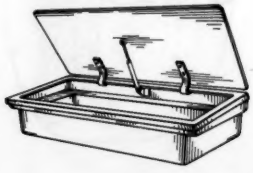
261,497
TIRE
Andre E. J. Baus, Colmar-Berg; Jean F. L. Fontaine, Ingeldorf, and Brian L. Ham, Mertzig, all of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 21, 1979, Ser. No. 13,492
Claims priority, application United Kingdom, Sep. 27, 1978, 986566
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



261,498
TIRE
Andre E. J. Baus, Colmar-Berg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 21, 1979, Ser. No. 13,590
Claims priority, application United Kingdom, Sep. 20, 1978, 986440
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



261,499
STORAGE TRUNK FOR A PICKUP TRUCK
Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182
Filed Jul. 12, 1979, Ser. No. 56,977
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

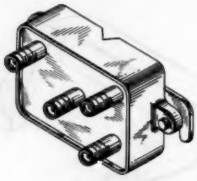


261,500
VEHICLE VISOR
James P. Butler, Lewisville, Tex., assignor to Affiliated Hatch and Sunroof, Inc., Dallas, Tex.
Filed Dec. 4, 1978, Ser. No. 966,470
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

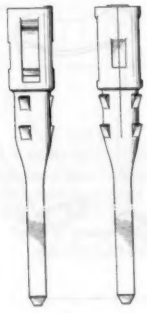
261,501
COMBINED AIR MUFFLER AND FILTER
Michael Schenker, Warren, N.J., assignor to Coilhose Pneumatics, Inc., Middlesex, N.J.
Filed Aug. 10, 1979, Ser. No. 65,592
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—194

261,502
WHEEL
Bjorn E. A. Envall, Vanersborg, Sweden, assignor to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Oct. 18, 1978, Ser. No. 952,566
Claims priority, application Sweden, Apr. 18, 1978, 78-1085
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

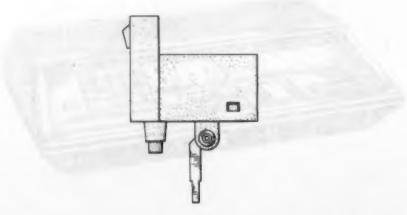
261,503
C.A.T.V. SIGNAL SPLITTER
David F. Shu, Hoffman Estate, Ill., assignor to TDS, Inc., Elk Grove Village, Ill.
Filed Apr. 18, 1979, Ser. No. 31,082
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11



261,504
PIN SOCKET
Gene C. Hollingsworth, Cerritos, Calif., assignor to Zero Corporation, El Monte, Calif.
Filed Oct. 2, 1978, Ser. No. 947,426
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

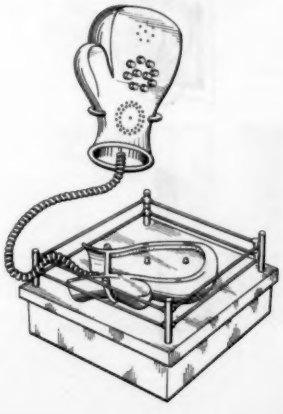


261,505
ELECTRICAL CONTROL HOUSING ASSEMBLY
Gerald K. Miller, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.
Filed Sep. 12, 1979, Ser. No. 74,635
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



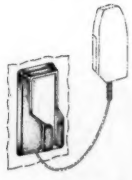
261,506
TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Sep. 10, 1979, Ser. No. 73,741
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

261,507
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed May 7, 1979, Ser. No. 36,587
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

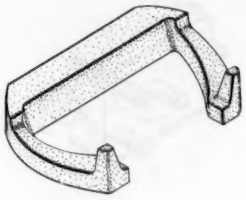


261,508
HAND-HELD TELEPHONE
John Pardo, Yonkers, N.Y., assignor to Leisurecraft Products Ltd., Plainview, N.Y.
Filed Aug. 10, 1979, Ser. No. 65,599
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—64

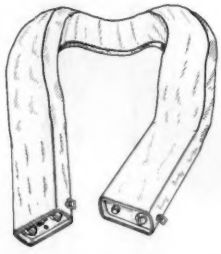
261,509
WALL MOUNTED HOLDER FOR A TELEPHONE SET
Richard E. Cobb, Western Springs, Ill., assignor to GTE Automatic Electric Labs. Inc., Northlake, Ill.
Filed Jun. 4, 1979, Ser. No. 44,899
Term of patent 14 years
Int. Cl. D14—*03;* D6—*01*
U.S. Cl. D14—65



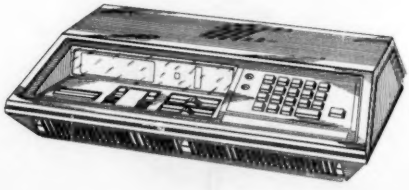
261,510
TELEPHONE HANDSET HOLDER
John H. Havens, Los Angeles, Calif., assignor to Antonio M. Escobedo, Sepulveda, Calif.
Filed Jul. 18, 1979, Ser. No. 58,731
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65



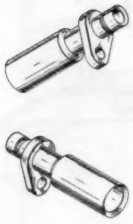
261,511
RADIO RECEIVER
William J. Hass, 3707 Russett La., Northbrook, Ill. 60062
Filed Dec. 14, 1979, Ser. No. 103,570
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



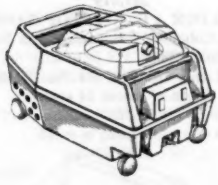
261,512
CLOCK RADIO OR SIMILAR ARTICLE
John S. Kolwaite, Dewitt, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Jan. 23, 1980, Ser. No. 114,712
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73



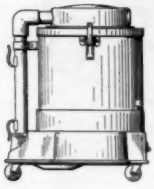
261,513
TRANSMISSION DETENT CABLE CONNECTOR
Richard B. Muller, 5415 Providence Rd., Charlotte, N.C. 28211
Filed Jan. 18, 1979, Ser. No. 4,500
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—5



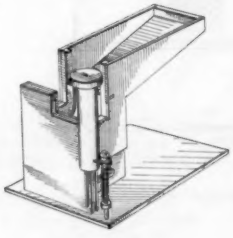
261,514
VACUUM CLEANER
Patrick D. Cody, Dollard des Ormeaux, Canada, assignor to Innova Equipment Limited, Quebec, Canada
Filed Dec. 27, 1979, Ser. No. 107,572
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21

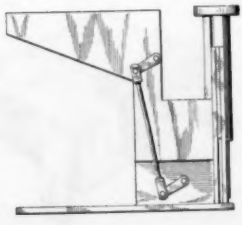


261,515
PRESSURE SPRAY CARPET CLEANER
Harold W. Schaefer, Bloomington, Ill., and Martin E. Wiese, South Bend, Ind., assignors to National Union Electric Corporation, Greenwich, Conn.
Filed Aug. 20, 1979, Ser. No. 67,730
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—23



261,516
MACHINE FOR DISPENSING AND INSERTING STICKS IN COMESTIBLES
Edward D. Cottrell, and Michael B. Robbins, both of Cattaraugus, N.Y., assignors to Champion International Corporation, Stamford, Conn.
Filed May 24, 1979, Ser. No. 42,002
Term of patent 14 years
Int. Cl. D07—*04*; D15—*08*
U.S. Cl. D15—92





261,517

FOODSTUFF MILL

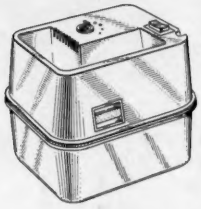
Thomas D. Dickson, Jr., 1099 Del Cambre, San Jose, Calif. 95129

Filed Apr. 9, 1979, Ser. No. 28,208

Term of patent 14 years

Int. Cl. D15—*08*

U.S. Cl. D15—98



261,518

BARRIER FREE DRINKING FOUNTAIN

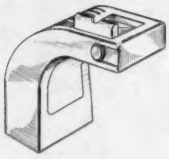
Ann F. Butter, and Bert Blumberg, both of 12 W. 96th St., New York, N.Y. 10025

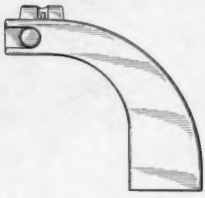
Filed Apr. 30, 1979, Ser. No. 34,428

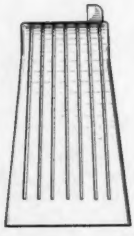
Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D15—118







261,519

HOUSING FOR A BENCH TOP BAND SAW

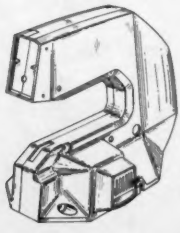
Edward A. Irelan, Columbia, Mo., assignor to Benchmark Tool Company, Vandalia, Ohio

Filed Aug. 31, 1979, Ser. No. 71,181

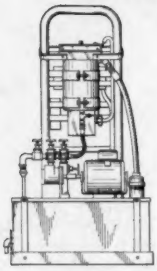
Term of patent 14 years

Int. Cl. D15—*09*

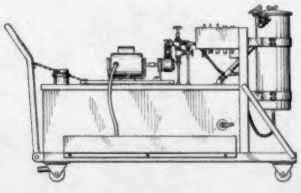
U.S. Cl. D15—134



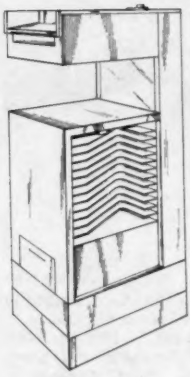
261,520
TWO-WHEELED OIL REFINER DOLLY OR THE LIKE
Lester L. Johnson, Sr., 6175 Fordham Cir., East, Jacksonville, Fla. 32217
Filed Aug. 22, 1979, Ser. No. 68,695
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—150



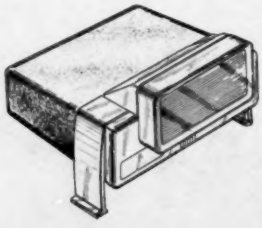
261,521
OIL REFINER MOVABLE CARRIAGE OR THE LIKE
Lester L. Johnson, Sr., 6175 Fordham Cir., East, Jacksonville, Fla. 32217
Filed Aug. 22, 1979, Ser. No. 68,696
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—150



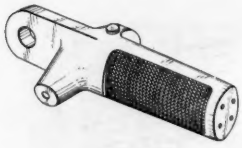
261,522
PAPER COLLATOR FOR USE WITH OFFICE COPYING MACHINES
Donald L. Snellman, 2807 W. Galer, Seattle, Wash. 98199
Filed Oct. 18, 1979, Ser. No. 86,032
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



261,523
ELECTRONIC FLASH OR SIMILAR ARTICLE
James M. Conner, Harrison, and James M. Ryan, New York, both of N.Y., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Sep. 25, 1978, Ser. No. 945,190
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

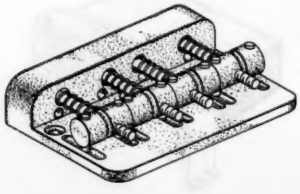


261,524
GRIP FOR A CINECAMERA
Masahiro Kando, Tokyo, and Hiroshi Shinkai, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 26, 1978, Ser. No. 973,110
Claims priority, application Japan, Jul. 3, 1978, 53-27956
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—44

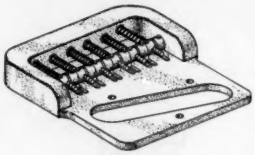


261,525
EYE GLASS FRAME
Irving Rips, Beverly Hills, Calif., assignor to Younger Manufacturing Company, Los Angeles, Calif.
Filed Jun. 11, 1979, Ser. No. 47,789
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—115

261,526
BRIDGE ASSEMBLY FOR GUITARS
Billie R. Carson, Placentia, Calif., assignor to CBS Inc., New York, N.Y.
Filed Oct. 9, 1979, Ser. No. 82,667
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21

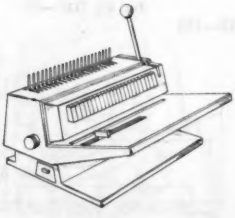


261,527
BRIDGE ASSEMBLY FOR GUITARS
Billie R. Carson, Placentia, Calif., assignor to CBS Inc., New York, N.Y.
Filed Oct. 11, 1979, Ser. No. 83,588
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21

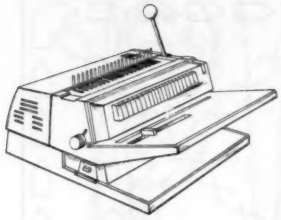


261,528
DESK TOP ELECTRONIC CALCULATOR
Masaaki Sakai, Tokyo, and Kunio Hirose, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 28, 1979, Ser. No. 52,989
Claims priority, application Japan, Jan. 15, 1979, 54-2567
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

261,529
COMBINED PUNCH AND BINDING MACHINE
Herbert H. Hausmann, Prairie View, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Sep. 4, 1979, Ser. No. 72,484
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D18—34



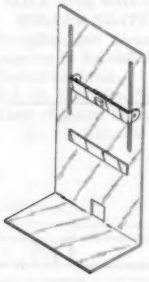
261,530
COMBINED ELECTRIC PUNCH AND BINDING MACHINE
Herbert H. Hausmann, Prairie View, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Sep. 4, 1979, Ser. No. 72,486
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D18—34



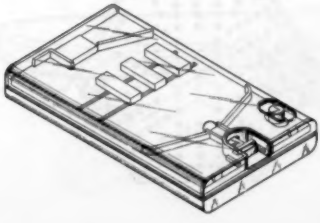
261,531
MARKING PEN
Guy Delcroix, Paris, France, assignor to Waterman S.A., Paris, France
Filed Jun. 11, 1979, Ser. No. 47,108
Claims priority, application France, Dec. 12, 1978, 77111
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—4

261,532
WRIST-WEARABLE TIME TEACHING INSTRUMENT
Toshinori Tabata, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 2, 1979, Ser. No. 90,546
Claims priority, application Japan, May 21, 1979, 54-20597
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64

261,533
TYPING COPY HOLDER
Bruce K. Nagley, 4765 Kingshill Dr., Columbus, Ohio 43229
Filed Feb. 21, 1980, Ser. No. 123,126
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

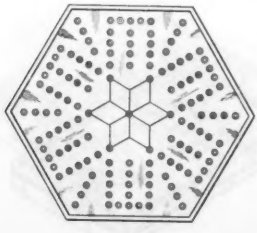


261,534
POCKET SIZE GAME BOX
Masaki Mayuzumi, and Masaaki Yoshimura, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 2, 1979, Ser. No. 90,312
Claims priority, application Japan, May 23, 1979, 54-20883
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—10

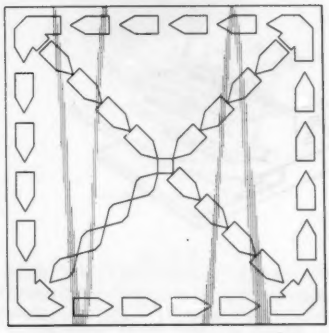


261,535
COMBINED BACKGAMMON GAME AND CARRYING CASE
Abraham I. Tawil, New York, N.Y., assignor to H.I.T. Industries Ltd., Avenel, N.J.
Filed May 12, 1977, Ser. No. 796,206
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15

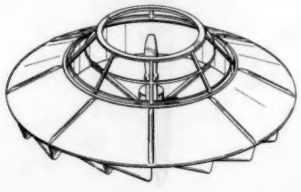
261,536
GAME BOARD
Michael C. Cicerrella, 1524 Lakeview Rd., #203, Clearwater, Fla. 33516
Filed Dec. 17, 1979, Ser. No. 104,164
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—20



261,537
GAME BOARD
Richard D. Homich, Box 600, R.D. 3, Annville, Pa. 17003
Filed Oct. 2, 1979, Ser. No. 81,238
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34

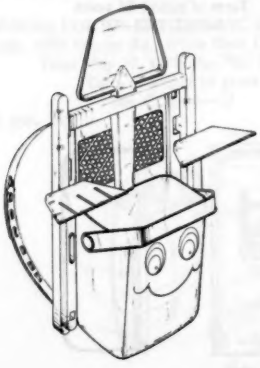


261,538
AERIAL TOY
James E. Sides, Rte. 3, Western Acres, El Campo, Tex. 77437
Filed Jul. 2, 1979, Ser. No. 54,137
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—86

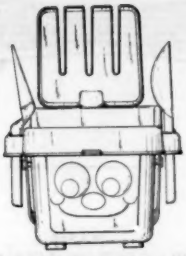


261,539
SHILLELAGH OR SIMILAR ARTICLE
Ernest H. Smith, P.O. Box 891, W. Sacramento, Calif. 95691
Filed Dec. 30, 1977, Ser. No. 866,461
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—211

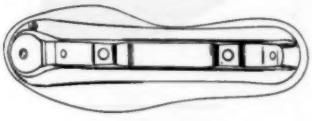
261,540
COMBINED TOY BUCKET AND TOOLS THEREFOR
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and Paul B. Means, III, Basking Ridge, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Oct. 22, 1979, Ser. No. 87,243
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



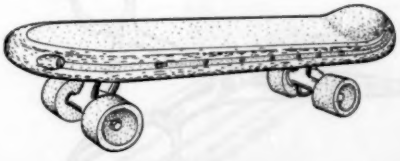
261,541
COMBINED TOY BUCKET AND TOOLS THEREFOR
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Apnel, Livingston, N.J.
Filed Feb. 8, 1980, Ser. No. 119,992
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



261,542
INTEGRAL SHOE SOLE AND WHEEL MOUNTING FOR ROLLER SKATE
David L. Landay, Brookline, and Alvan H. Wolf, Worcester, both of Mass., assignors to Brookfield Athletic Shoe Company, Inc., East Brookfield, Mass.
Filed Jul. 18, 1979, Ser. No. 40,115
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

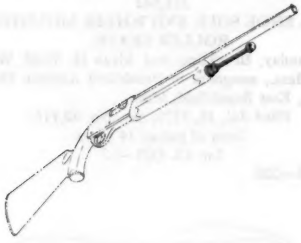


261,543
SKATEBOARD
Leonard A. Morris, Sr., 138 Panorama Dr., Benicia, Calif. 94510
Filed Jan. 28, 1980, Ser. No. 115,740
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

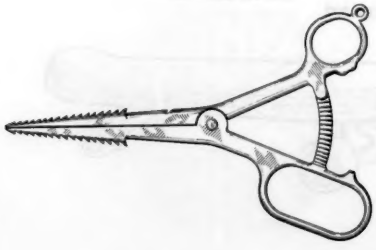


261,544
SKATEBOARD
Lyle L. Cramer, 1113 Markham, Flint, Mich. 48507
Continuation-in-part of Ser. No. 900,333, Apr. 26, 1978, abandoned. This application Sep. 2, 1980, Ser. No. 183,047
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

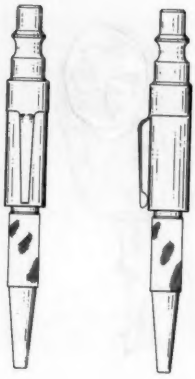
261,545
ADJUSTABLE PLUG FOR SHOTGUN SHELL CHAMBER
Larry A. Holmberg, 5765 Main St., Fridley, Minn. 55432
Filed Mar. 3, 1980, Ser. No. 126,533
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



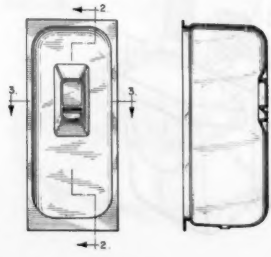
261,546
FISH HOLDING TOOL
Ronald W. Smalley, 5415 SE. 174th St., Portland, Oreg. 97236
Filed Apr. 14, 1980, Ser. No. 140,233
Term of patent 14 years
Int. Cl. D22—*05;* D8—*03*
U.S. Cl. D22—31



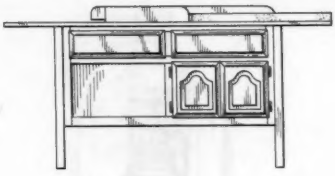
261,547
AIR REGULATING NOZZLE
W. Rod Parke, R.F.D. No. 3, Dixon, Ill. 61021
Filed May 29, 1979, Ser. No. 42,859
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34



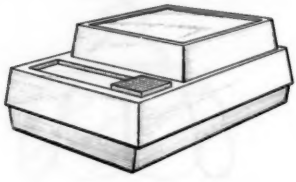
261,548
MODULAR SHOWER STALL
James E. Chisholm, Mariemont, Ohio, assignor to MCC-Powers-Fiat, Skokie, Ill.
Filed Jun. 1, 1979, Ser. No. 44,703
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



261,549
PEDIATRIC EXAMINATION TABLE
Donald R. Patterson, 2509 Jackson, Joplin, Mo. 64801
Filed Apr. 12, 1979, Ser. No. 29,286
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—3



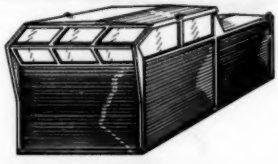
261,550
CONTACT LENS STERILIZER UNIT
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Aug. 23, 1979, Ser. No. 69,112
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9



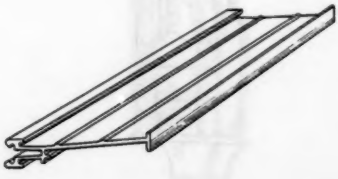
261,551
HOUSING FOR AN ELECTRONIC STIMULATOR
Eli Boroda, 3896 Effress Rd., White Bear Lake, Minn. 55110
Filed May 10, 1979, Ser. No. 37,633
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41

261,552
HOUSING FOR AN ELECTRONIC STIMULATOR
Eli Boroda, 3896 Effress Rd., White Bear Lake, Minn. 55110
Filed May 10, 1979, Ser. No. 37,634
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41

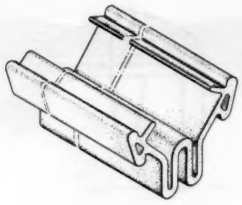
261,553
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 146,001
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



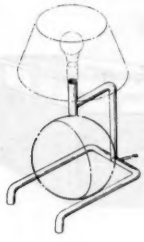
261,554
CABLE CHANNEL SHELF
Bengt E. Legerius, Hagvägen 6, S-611 00 Nyköping, Sweden
Filed Feb. 19, 1980, Ser. No. 122,303
Claims priority, application Sweden, Sep. 7, 1979, 79-1983
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,555
EXPANSION JOINT SEALING STRIP FOR ROADWAY JOINTS AND THE LIKE
William E. Bowman, Englewood, Colo., assignor to Bowman Construction Supply, Inc., Denver, Colo.
Filed Mar. 26, 1980, Ser. No. 134,310
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,556
COMBINED LAMP BASE AND BALL HOLDER
Bryan O'Reilly, 129 Franklin St., Westfield, Mass. 01085
Filed May 31, 1979, Ser. No. 44,052
Term of patent 14 years
Int. Cl. D26—*05*; D6—*04*
U.S. Cl. D26—51



261,557
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 35,997
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

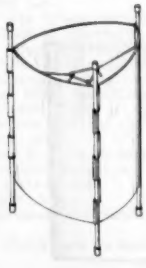
261,558
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 36,000
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

261,559
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 36,001
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

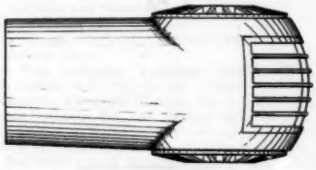
261,560
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 36,002
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

261,561
LIGHTING FIXTURE
Marc-André Letourneau, 3600 Park Ave., Apt. 1611, Montreal, Quebec, Canada
Filed Feb. 16, 1979, Ser. No. 12,602
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—88

261,562
LAMP
Akira Suzuki, Tokyo, Japan, assignor to Kazusuke Takagi, Tokyo, Japan, a part interest
Filed Oct. 4, 1979, Ser. No. 81,679
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—111



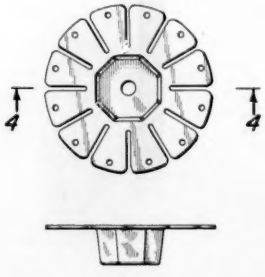
261,563
HAIR DRYER
Ernest Lee, Park Ridge, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jun. 30, 1980, Ser. No. 164,191
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



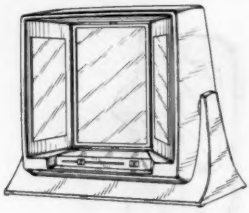
261,564
RAZOR HANDLE
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 7, 1979, Ser. No. 101,164
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

261,565
RAZOR HANDLE
Kenneth H. Grange, London, England, assignor to Wilkinson Sword Ltd., Buckinghamshire, England
Filed Jan. 3, 1980, Ser. No. 109,290
Claims priority, application United Kingdom, Jul. 16, 1979, 990 721/79
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

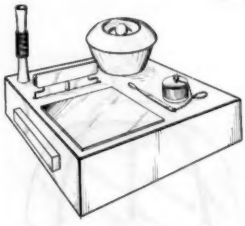
261,566
COMBINATION FLOSS HOLDER, KEY CHAIN FOB AND DENTAL APPOINTMENT REMINDER
David V. Olson, St. Paul, Minn.
Continuation-in-part of Ser. No. 881,078, Feb. 23, 1978, Pat. No. Des. 255,388. This application Jul. 30, 1979, Ser. No. 62,101
Term of patent 14 years
Int. Cl. D29—*99*; D3—*01*
U.S. Cl. D28—64



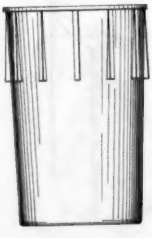
261,567
MAKE-UP MIRROR
Alfred W. Madl, Glendale, Wis., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Feb. 8, 1980, Ser. No. 119,731
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—67



261,568
COMBINED CADDY FOR POWDERED PRODUCTS OR THE LIKE AND IMPLEMENTS THEREFOR
Ralph L. Davis, Washington, D.C., assignor to Wilbert A. Payne, Seat Pleasant, Md.
Filed Feb. 14, 1979, Ser. No. 12,031
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—77



261,569
DRUM
Roger E. Darois, Perryville, Md., assignor to Container Corporation of America, Chicago, Ill.
Filed Sep. 4, 1979, Ser. No. 72,568
Term of patent 14 years
Int. Cl. D99—*99*
U.S. Cl. D34—39



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Carl Munters: *See*—
Norbach, Per, 4,296,780, Cl. 138-40.000.

AB ASEA-ATOM: *See*—
Olsson, Torsten, 4,297,171, Cl. 376-440.000.

AB Jarnkonstruktioner: *See*—
Jarnum, Lennart, 4,296,516, Cl. 14-71.700.

AB Volvo: *See*—
Mattsson, Karl-Erik H., 4,296,679, Cl. 92-52.000.

Abbott Laboratories: *See*—
Muetterties, Andrew J.; Vcelka, John L.; and Kelsey, Wayne R., 4,296,949, Cl. 285-18.000.

Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, to Sakai Chemical Industry Co., Ltd. Method for packing catalysts. 4,297,248, Cl. 252-477.00R.

Abe, Osamu: *See*—
Furuhashi, Toshio; and Abe, Osamu, 4,296,722, Cl. 123-492.000.

Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, to Kao Soap Co., Ltd. Cosmetic composition for skin and hair treatment. 4,297,340, Cl. 424-70.000.

Abele, Karl-Heinz: *See*—
Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.

Abeler, Gerd; and Maul, Rudolf, to Ciba-Geigy Corporation. 1,4-Dihydro-2,6 dimethylyridine-3,5-dicarboxylic acid ester compositions. 4,297,268, Cl. 260-45.80N.

Abex Corporation: *See*—
Kennedy, Leroy P., 4,296,707, Cl. 116-58.00A.

Abo, Toshimi; and Kanegae, Hidetoshi, to Nissan Motor Company, Limited. Fuel control device for a gas turbine. 4,296,600, Cl. 60-39.28R.

Aboelfotoh, Mohamed O., to International Business Machines Corporation. D.C. Scan panel. 4,297,613, Cl. 315-58.000.

Abramovich, Dan: *See*—
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, 4,297,054, Cl. 405-168.000.

Abrams, Richard L.: *See*—
Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., 4,297,704, Cl. 343-113.00R.

Accattino, Andrea: *See*—
Becchi, Raffaele; Giacone, Felice; and Accattino, Andrea, 4,297,573, Cl. 250-231.0SE.

ACF Chemiefarma NV: *See*—
van Zorge, Jacob A., 4,297,359, Cl. 424-263.000.

Achard, Georges; Chion, Pierre; and Menault, Jacques, to Rhone-Poulenc-Textile. Two-component mixed acrylic fibres wherein acrylic components have different amounts of non-ionizable plasticizing comonomer. 4,297,412, Cl. 428-370.000.

Acurex Corporation: *See*—
Carlton, Richard J., 4,297,572, Cl. 250-203.00R.

Adams, James R., Jr., to Rollei of America, Inc. Photoflash device. 4,297,011, Cl. 354-23.00D.

Adamson, Arthur P., to General Electric Company. Turbine cooling air modulation apparatus. 4,296,599, Cl. 60-39.230.

Adreas Stihl: *See*—
Dirks, Rudolf; and Nitschmann, Karl, 4,296,553, Cl. 30-381.000.

Aeroquip Corporation: *See*—
Allread, Alan R., 4,296,914, Cl. 251-149.200.
Gies, Paul E., 4,296,675, Cl. 91-396.000.
McCracken, Donald G., 4,296,952, Cl. 285-98.000.

Agence Nationale de valorisation de la Recherche (ANVAR): *See*—
Monties, Jean R.; and Havlik, Patrick J. C., 4,296,500, Cl. 3-1.700.

Agency of Industrial Science & Technology: *See*—
Shimizu, Ken-Ichi; and Ikeya, Chuji, 4,297,725, Cl. 358-125.000.

AGFA-Gevaert AG: *See*—
Bergthaller, Peter; Saleck, Wilhelm; Lapp, Otto; and Mucke, Bruno, 4,297,439, Cl. 430-434.000.
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, 4,297,438, Cl. 430-377.000.
Puschmann, Werner, 4,297,585, Cl. 250-560.000.

Aggarwal, Sundar L.: *See*—
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.

Agip Nucleare, S.p.A.: *See*—
Brambilla, Giovanni; and Sartorelli, Adelmo, 4,297,174, Cl. 204-1.500.

Ahmann, John E. Punch frame for data registering device. 4,297,566, Cl. 235-50.00R.

Ahmed, Adel A. A., to RCA Corporation. Amplifier with cross-over current control. 4,297,644, Cl. 330-264.000.

Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground swing. 4,296,923, Cl. 272-85.000.

Ahrweiler, Karl-Heinz: *See*—
Kusters, Eduard; and Ahrweiler, Karl-Heinz, 4,296,537, Cl. 29-116.0AD.

Aikoh Co., Ltd.: *See*—
Hayashi, Yoshihiro, 4,296,921, Cl. 266-270.000.

Aimono, Yuji: *See*—
Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, 4,297,471, Cl. 526-328.000.

Airey, Frederick K.; and Evans, Arthur R. Apparatus for separating and contacting friable particulate organic matter from and with liquids. 4,297,213, Cl. 210-195.100.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Kagata, Tooru; and Goto, Hiromi, 4,296,848, Cl. 192-35.000.
Kizaki, Jiro; and Fujii, Takashi, 4,296,604, Cl. 60-562.000.
Terada, Takami, 4,296,966, Cl. 297-369.000.

Aitken, Inc.: *See*—
Cusick, Kenneth M., 4,297,116, Cl. 55-319.000.

Ajinomoto Company, Incorporated: *See*—
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.
Yasuda, Naohiko; and Nakanishi, Eiji, 4,297,279, Cl. 260-239.100.

Akebono Brake Industry Co., Ltd.: *See*—
Nakazato, Hiroshi, 4,296,971, Cl. 303-115.000.

Akimoto, Hidetoshi: *See*—
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.

Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, to OKI Electric Industry Co., Ltd. Hybrid integrated circuit and a method for producing the same. 4,297,647, Cl. 330-307.000.

Akkerman, Neil H., to Baker International Corporation. Apparatus for pumping fluid from a well through a tubing string. 4,297,087, Cl. 417-378.000.

Akkerman, Neil H., to Baker International Corporation. Pump assembly comprising gas spring means. 4,297,088, Cl. 417-378.000.

Aktiebolaget Electrolux: *See*—
Kullander, Jan O., 4,296,982, Cl. 312-257.00R.

Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, to Mitsubishi Petrochemical Co., Ltd. Process for producing electric conductors coated with crosslinked polyethylene resin. 4,297,310, Cl. 264-83.000.

Akzona Incorporated: *See*—
Bohler, Joachim; and Jordon, Hans, 4,296,517, Cl. 15-93.00R.
Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., 4,297,351, Cl. 424-241.000.

Albany International Corporation: *See*—
Bloyce, Lionel T.; and Morley, Michael J., 4,296,886, Cl. 239-264.000.

Alberto-Culver Company: *See*—
Dasher, George F.; and Schamper, Thomas J., 4,297,098, Cl. 8-412.000.

Albrecht, Ernst: *See*—
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, 4,296,697, Cl. 112-109.000.

Alcan Research and Development Limited: *See*—
Dube, Ghyslain, 4,297,105, Cl. 23-230.00R.

Aldrich, Frederic C., to General Motors Corporation. Engine fuel system with fuel/water separation. 4,296,723, Cl. 123-510.000.

Alfa-Pet, Inc.: *See*—
Schulein, Benjamin M., Jr., 4,296,709, Cl. 119-1.000.

Allegheny Ludlum Steel Corporation: *See*—
Patil, Balaji V.; and Tommaney, Joseph W., 4,297,132, Cl. 75-10.00V.

Allen, Gordon H., to Motorola, Inc. Glitch eliminator circuit for TTL transparent latch. 4,297,593, Cl. 307-247.00R.

Allied Chemical Coporation: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,296,535, Cl. 28-257.000.

Allo, Vincent F., to Chicago Bridge & Iron Company. Freeze exchanger with removable tube liner. 4,296,612, Cl. 62-123.000.

Allport, Maurice J.: *See*—
Nicol, Thomas; Wiley, David; and Allport, Maurice J., 4,297,631, Cl. 320-64.000.

Allread, Alan R., to Aeroquip Corporation. Full flow breakaway coupling. 4,296,914, Cl. 251-149.200.

Alnor Oy: *See*—
Lindstrom, YrjoV., 4,296,627, Cl. 73-15.00R.

Alps Electric Co., Ltd.: *See—*
Niinuma, Akira, 4,297,541, Cl. 200-5.00E.
Tsutsui, Kotaroh; and Kinugawa, Ryoji, 4,297,540, Cl. 200-5.00B.
Alsthom-Atlantique: *See—*
Roux, Marc, 4,296,692, Cl. 105-397.000.
Alston, William G. Jump trainer. 4,296,925, Cl. 273-1.50A.
Altmeyer, Hans J.; and Gebel, Josef, to Hein, Lehmann AG. Belt filter press. 4,297,215, Cl. 210-386.000.
Aluma Form, Inc.: *See—*
Farmer, Marion R., 4,296,904, Cl. 248-218.400.
Aluminum Company of America: *See—*
Foster, Perry A., Jr., 4,297,180, Cl. 204-67.000.
Amada Company, Limited: *See—*
Kaneko, Tomonobu, 4,296,661, Cl. 83-796.000.
Amano, Hisao: *See—*
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, 4,297,594, Cl. 307-252.00C.
Amazawa, Kiyoshi: *See—*
Tanaka, Kouichi; and Amazawa, Kiyoshi, 4,297,645, Cl. 330-280.000.
AMCA International Corporation: *See—*
Heckelsberg, Robert E., 4,296,581, Cl. 52-520.000.
American Can Company: *See—*
Detroit, William J.; and Sanford, Michael E., 4,296,813, Cl. 166-293.000.
Nerod, Irving, 4,297,583, Cl. 250-453.000.
American Chemical & Refining Company Incorporated: *See—*
Fletcher, Augustus; and Moriarty, William L., 4,297,177, Cl. 204-43.00N.
Skomoroski, Robert M., 4,297,179, Cl. 204-47.000.
American Cyanamid Company: *See—*
Bernstein, Seymour, 4,297,372, Cl. 424-315.000.
Los, Marinus, 4,297,128, Cl. 71-92.000.
Lutz, Albert W.; and Diehl, Robert E., 4,297,127, Cl. 71-88.000.
O'Neal, Thomas D., 4,297,126, Cl. 71-78.000.
Wissner, Allan, 4,297,516, Cl. 568-330.000.
American Home Products Corporation: *See—*
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,297,373, Cl. 424-322.000.
American Science and Engineering, Inc.: *See—*
Silk, John K., 4,296,737, Cl. 126-438.000.
American Standard Inc.: *See—*
Lippa, Giuseppe, 4,296,908, Cl. 249-58.000.
Little, Donald R., 4,297,548, Cl. 200-61.080.
AMF Incorporated: *See—*
Koch, Claude V., 4,297,546, Cl. 200-38.00R.
Amos, Richard W.: *See—*
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.
AMP Incorporated: *See—*
Herrmann, Henry O., Jr., 4,296,986, Cl. 339-89.00C.
Hughes, Donald W. K.; and Myers, Ronald W., 4,296,991, Cl. 339-176.0MP.
Kobler, Robert J., 4,296,550, Cl. 29-884.000.
Warner, Gary N., 4,296,988, Cl. 339-97.00R.
Ampex Corporation: *See—*
Quan, Ronald, 4,297,620, Cl. 315-389.000.
Anaconda Company, The: *See—*
Rice, Hoyt G., Jr.; and Reynolds, Daniel J., 4,296,576, Cl. 52-90.000.
Anderson, Alonzo B. Anti-backflow valve for sewer traps. 4,296,778, Cl. 137-433.000.
Anderson Company of Indiana, The: *See—*
Arndt, John J., 4,296,520, Cl. 15-250.320.
Anderson, Robert L.: *See—*
Northup, Robert P.; and Anderson, Robert L., 4,296,670, Cl. 89-43.00R.
Andersson, Poul G., to Ring Lock Container S. A. Receptacle with a cover of plastics material. 4,296,871, Cl. 220-306.000.
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, to Nippon Toki Kabushiki Kaisha; and Watanabe Instruments Corp. Thermal pen. 4,297,714, Cl. 346-139.00C.
Ando, Ryo; and Sato, Kazuyoshi, to Nippon Kokan Kabushiki Kaisha. Apparatus for vitrifying blast furnace slag. 4,297,119, Cl. 65-141.000.
Andreoni, Alessandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.
Andresen, Rolf; and Christian, John H., to International Business Machines Corporation. Sector servo with sync marks. 4,297,737, Cl. 360-135.000.
Andrews, David K.; and Smart, Michael W., to Dowty Fuel Systems Limited. Control mechanism. 4,296,676, Cl. 91-417.00R.
Anezaki, Yoshimitsu, to Tokyo Shibaura Electric Co., Ltd. Electron gun structure. 4,297,612, Cl. 313-446.000.
Angleman, John D.: *See—*
Henriques, Lance, 4,297,701, Cl. 343-6.5LC.
Angstrohm Precision, Inc.: *See—*
Solow, Benjamin, 4,297,670, Cl. 338-195.000.
Anic S.p.A: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.
Anritsu Electric Company Limited: *See—*
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.
Antes, Gregor; and Greenaway, David L., to LGZ Landis & Gyr Zug AG. Projection screen and method for making same. 4,297,001, Cl. 350-129.000.
Antonious, Anthony J. Adjustable and flexible closure assembly for shoes with segmented uppers. 4,296,558, Cl. 36-50.000.
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., to Health Innovations, Inc. Torsion exercise apparatus. 4,296,924, Cl. 272-117.000.
Anzaldua, David A.: *See—*
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., 4,296,924, Cl. 272-117.000.
Aoki, Harumi: *See—*
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,297,014, Cl. 354-25.000.
Aoki, Hatsuo: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive element. 4,297,440, Cl. 430-505.000.
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., to Compagnie Honeywell Bull. Call and stack mechanism for procedures executing in different rings. 4,297,743, Cl. 364-200.000.
Arai, Seiichi: *See—*
Ieki, Hideharu; and Arai, Seiichi, 4,297,660, Cl. 333-194.000.
Arakawa, Mitsuaki: *See—*
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,297,637, Cl. 324-309.000.
Aratame, Kazuhisa: *See—*
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.
Arbel, Arie; and Kurz, Rainer, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Circuit for continuous conversion of signals into digital magnitudes. 4,297,679, Cl. 340-347.0AD.
Arbit, Harry A.: *See—*
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., 4,297,152, Cl. 149-88.000.
Archer, Richard W. Beach umbrella support. 4,296,693, Cl. 108-28.000.
Armbrust, William D.; and McCreery, James F., to Kennametal Inc. Indexable cutting insert. 4,297,058, Cl. 407-113.000.
Armentrout, James L.; and Schneider, George H. Devious path bacterial barrier. 4,296,862, Cl. 206-439.000.
Arndt, Frederick P., to General Motors Corporation. Transmission shift lever backdrive and column locking mechanism. 4,296,847, Cl. 192-4.00A.
Arndt, John J., to Anderson Company of Indiana, The. Pin connector. 4,296,520, Cl. 15-250.320.
Arnold, Bernhard: *See—*
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Arnold, Dan M.: *See—*
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., 4,297,575, Cl. 250-265.000.
Arnold, Harmon W.; and Erwin, Galen B., to Flex-o-lators, Inc. Component strand for wire fabrics. 4,297,418, Cl. 428-595.000.
Arons, Howard L.: *See—*
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Arthur Smith Industries, Inc.: *See—*
Balbach, George C.; and Peterman, Robert J., 4,296,570, Cl. 49-360.000.
Artz, Glen D.: *See—*
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., 4,297,152, Cl. 149-88.000.
Asahi Glass Company, Ltd.: *See—*
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,297,182, Cl. 204-98.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,297,014, Cl. 354-25.000.
Asahi-Seiki Manufacturing Co., Ltd.: *See—*
Ohdai, Yozo; and Takahata, Yasuyuki, 4,296,621, Cl. 72-130.000.
Asami, Takayoshi, to Kobe Steel, Limited. Heat transfer tubing for natural gas evaporator. 4,296,539, Cl. 29-157.30A.
Asano, Masahide: *See—*
Miki, Tosaku; and Asano, Masahide, 4,297,357, Cl. 424-251.000.
Asdollahi, Nasrollah, to Wickmann Werke AG. Slow-blowing fuse using zinc-manganese alloy link. 4,297,666, Cl. 337-163.000.
Ashworth, Denis H., to Simon Engineering Dudley Limited. Hydraulically operated access equipment. 4,296,833, Cl. 182-2.000.
Atkin, Howard S., to Holset Engineering Company Limited. Sealing assembly. 4,296,934, Cl. 277-81.00R.
Atlantic Richfield Company: *See—*
Mooi, John, 4,297,244, Cl. 252-455.00Z.
Aubert, Ralph: *See—*
Gander, Jean-Gabriel; and Aubert, Ralph, 4,297,533, Cl. 179-84.0VF.
AuClair, Christopher J.: *See—*
Williams, Meurig W.; and AuClair, Christopher J., 4,297,427, Cl. 430-108.000.

Augat Inc.: *See*—
Bertoglio, Guido, 4,296,549, Cl. 29-874.000.
Wellington, Roger D., 4,296,993, Cl. 339-275.00B.

Augst, Horst G., to Telefonaktiebolaget L M Ericsson. Crystal filter structure. 4,297,659, Cl. 333-191.000.

Autoclave Engineers, Inc.: *See*—
Ruyak, Robert F., 4,296,912, Cl. 251-65.000.

Automated Building Components, Inc.: *See*—
Jureit, John C.; and Greenley, Henry R., 4,297,048, Cl. 403-189.000.

Automotive Products Limited: *See*—
Farrant, David J. R., 4,297,047, Cl. 403-138.000.

Autotote, Ltd.: *See*—
Lees, Robert, 4,297,039, Cl. 400-120.000.

Aviram, Ari, to International Business Machines Corporation. Photodeformable article having photoionizable groups on a polymer backbone. 4,297,434, Cl. 430-270.000.

Ayabe, Hideaki: *See*—
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.

B. F. Goodrich Company, The: *See*—
Blalock, Gary L., 4,296,855, Cl. 198-502.000.
Cohen, Louis, 4,297,320, Cl. 422-131.000.
Lai, John T., 4,297,497, Cl. 544-384.000.

Babb, Burton A. Dynamic loudspeaker. 4,297,537, Cl. 179-180.000.

Babcock, John C.; Campbell, J. Allan; and Lobl, Thomas J., to Upjohn Company, The. Male contraceptive steroids and methods of use. 4,297,350, Cl. 424-238.000.

Babcock & Wilcox Company, The: *See*—
Brunson, William T.; and Lexa, Anthony F., 4,297,581, Cl. 250-391.000.
Zadiraka, Allan J., 4,296,730, Cl. 126-421.000.

Bacardit, Juan S., to Bendiberica S.A. Power steering mechanism. 4,296,673, Cl. 91-375.00A.

Bacchi, Anthony C.: *See*—
Kress, Robert W.; and Bacchi, Anthony C., 4,296,896, Cl. 244-12.400.

Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., to International Business Machines Corporation. Document feeder system having a suspending-/commencing mode. 4,297,025, Cl. 355-14.0SH.

Bachofen AG.: *See*—
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,774, Cl. 137-322.000.
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,775, Cl. 137-322.000.

Bachtell, Stephen R. Method and apparatus for securing a hairpiece. 4,296,765, Cl. 132-53.000.

Bagusche, Siegfried, to W. Hegenscheidt Gesellschaft mbH. Smoothing rolling mill. 4,296,620, Cl. 72-100.000.

Baker, Cole H., to Intec Corporation. Absolute DC system for a laser inspection system. 4,297,587, Cl. 250-563.000.

Baker, Eugene E.; and Carter, Ernest E., Jr., to Halliburton Services. Isolation packer extension. 4,296,808, Cl. 166-191.000.

Baker, Gerald E. Earthquake alarm system. 4,297,690, Cl. 340-690.000.

Baker International Corporation: *See*—
Akkerman, Neil H., 4,297,087, Cl. 417-378.000.
Akkerman, Neil H., 4,297,088, Cl. 417-378.000.

Balbach, George C.; and Peterman, Robert J., to Arthur Smith Industries, Inc. Hydraulic door operator. 4,296,570, Cl. 49-360.000.

Baldwin, Gary L.; and McCreary, James L., to Bell Telephone Laboratories, Incorporated. Offset correction in operational amplifiers. 4,297,642, Cl. 330-9.000.

Baldwin Piano & Organ Company: *See*—
Wade, David R.; and Munch, Walter, 4,296,667, Cl. 84-345.000.

Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F. Covers for electrical boxes. 4,296,870, Cl. 220-3.300.

Ballinger, Paul V. Demountable interconnection. 4,297,074, Cl. 414-723.000.

Ballmann, Josef. Projectile with spin-producing flow passages. 4,296,893, Cl. 244-3.230.

Bally Manufacturing Corporation: *See*—
Frederiksen, Jeffrey E., 4,296,930, Cl. 273-313.000.

Bals, Hans G. Process and apparatus for extracting a substance from a body of water. 4,297,218, Cl. 210-661.000.

Baltensperger, Rudolf; and Pfister, Hans B. Hanger for track-type suspended railway. 4,296,690, Cl. 104-91.000.

Bando, Yoshiaki: *See*—
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, 4,296,954, Cl. 285-331.000.

Banucci, Eugene G.; and Boldebuck, Edith M., to General Electric Company. Particulated polyetherimide and method for making. 4,297,385, Cl. 427-27.000.

Barcza, Sandor, to Sandoz, Inc. Silicon-bearing carboxylic acids and amides. 4,297,349, Cl. 424-184.000.

Barge, Presley O. Spherical living module or space. 4,296,892, Cl. 244-2.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Martens, Gerhard, 4,296,889, Cl. 242-18.100.

Barnoski, Michael K.: *See*—
Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., 4,297,704, Cl. 343-113.00R.

Barrash, Marshall J., to Coca-Cola Company, The. Elastic band and handle structure for forming packages of groups of containers. 4,296,861, Cl. 206-428.000.

Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, to Pfaff Industriemaschinen GmbH. Sewing machine with a work holder for wrapping button shanks. 4,296,697, Cl. 112-109.000.

Bartl, Herbert: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.

Bartley, Burton H.; and Estes, John H., to Texaco Inc. Catalyst for the preparation of methane. 4,297,245, Cl. 252-460.000.

Bartolac, Robert R. Hair dryer. 4,297,564, Cl. 219-367.000.

Barton, C. D. Connection device for golf club head covers. 4,296,787, Cl. 150-52.00G.

BASF Aktiengesellschaft: *See*—
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.
Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, 4,297,300, Cl. 260-544.00C.
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.
Manzke, Klaus; Brotzler, Roland; and Schulze-Berge, Klaus, 4,297,736, Cl. 360-109.000.
Reissenweber, Gernot; and Mangold, Dietrich, 4,297,491, Cl. 544-105.000.
Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, 4,297,493, Cl. 544-241.000.
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.
Schenck, Hans-Uwe; and Gulbins, Erich, 4,297,255, Cl. 260-18.0PF.

Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A. Speed governor for a hydroelectric unit. 4,297,589, Cl. 290-40.00R.

Battelle Development Corporation: *See*—
Beale, Harry A., 4,297,387, Cl. 427-38.000.

Baugh, Edward D.; and Hoffman, Mark B., to General Motors Corporation. Diesel engine shutdown control system. 4,296,718, Cl. 123-198.00D.

Baumann, Hans D. Eccentric rotary disk valve with elastic metal seal. 4,296,915, Cl. 251-174.000.

Baumann, Hans-Peter, to Sandoz Ltd. Quaternized polyamines. 4,297,296, Cl. 260-459.00A.

Baxter Travenol Laboratories, Inc.: *See*—
Cunningham, Joel, 4,297,316, Cl. 422-1.000.
Groman, Ernest V.; and Cabelli, Michael D., 4,297,494, Cl. 544-267.000.

Bayer Aktiengesellschaft: *See*—
Becker, Robert; Grolig, Johann; and Rasp, Christian, 4,297,501, Cl. 560-24.000.
Boehmke, Gunther, 4,297,107, Cl. 44-51.000.
Buxbaum, Gunter; Schopper, Heinrich-Christian; Leitner, Lutz; and Hahnkamm, Volker, 4,297,395, Cl. 427-127.000.
Eicher, Theobald; and Muller, Friedemann, 4,296,762, Cl. 131-359.000.
Ertel, Werner, 4,297,519, Cl. 568-424.000.
Finke, Ulrich; and Moretto, Hans-Heinrich, 4,297,500, Cl. 556-466.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.
Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, 4,297,371, Cl. 424-304.000.
Hendricks, Udo-Winfried; and Wollny, Klaus, 4,297,103, Cl. 8-534.000.
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.
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Bortle, Bonnie. Self-packaging urine conduit. 4,296,502, Cl. 4-144.100.
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Bowden, Wade R., Jr., to Slater Electric Inc. Electrical outlet box and pawl mounting device. 4,297,525, Cl. 174-58.000.
Bowman, Wayne A.; Bishop, John F.; and Noonan, John M., to Eastman Kodak Company. Two-sheet diffusion transfer assemblages and photographic elements. 4,297,432, Cl. 430-215.000.
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Carlsson, Per-Olov A. V.; and Hakansson, Bo H., to Gambro AB. Electrical stimulator. 4,296,760, Cl. 128-788.000.

Carlton, Richard J., to Acurex Corporation. Tracking solar energy collector assembly. 4,297,572, Cl. 250-203.00R.

Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., to Akzona Incorporated. Method of manufacture and use of improved 2β, 16β-piperidino androstanes. 4,297,351, Cl. 424-241.000.

Carnes, Irven S., to Raytheon Company. Polyphase coded fuzing system. 4,297,702, Cl. 343-7.0PF.

Carrier Corporation: *See—*
Straslicka, William A., 4,296,538, Cl. 29-156.40R.

Carroll, Charles B.; and Scheible, Howard G., to RCA Corporation. Method for preparing stylus lapping discs. 4,297,312, Cl. 264-134.000.

Carter, Ernest E., Jr.: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,296,808, Cl. 166-191.000.

Carter, William R. Airborne dust monitor. 4,297,578, Cl. 250-343.000.

Cascade Corporation: *See—*
Didtel, Stuart R., 4,297,070, Cl. 414-497.000.

Cassel, Knut E.; and Molin, Bengt T., to U.S. Philips Corporation. Luneberg lens antenna. 4,297,709, Cl. 343-754.000.

Castanie, Francis: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.

Caterpillar Tractor Co.: *See—*
Day, Ralph R.; and Wulff, B. James, 4,296,917, Cl. 254-400.000.
Fuzzell, Joe E., 4,297,687, Cl. 340-626.000.
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., 4,297,742, Cl. 361-154.000.

Cavalli born Meyer, Chantal: *See—*
Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, 4,297,466, Cl. 526-218.000.

Cazenave, Paul: *See—*
Horman, Ian; and Cazenave, Paul, 4,297,380, Cl. 426-597.000.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
Paulus, Philippe, 4,297,398, Cl. 427-320.000.

Centre National de Transfusion Sanguine: *See—*
Claude, Matte, 4,297,104, Cl. 23-230.00B.

Centre National pour l'Exploitation des Oceans: *See—*
Sachetto, Jean-Pierre; and Cuccolo, Sergio, 4,297,137, Cl. 106-15.050.

Centro Ricerche Fiat S.p.A.: *See—*
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.

Ceserani, Roberto: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.

Ceskoslovenska Akademie Ved: *See—*
Beranek, Jaroslav, 4,297,321, Cl. 422-143.000.

Cha, John H.: *See—*
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, 4,297,054, Cl. 405-168.000.

Chaborski, Hoiko, to MITEC-Moderne-Industrietechnik GmbH. Method and apparatus for measuring the distance and/or relative elevation between two points. 4,297,030, Cl. 356-5.000.

Chamberlin, Richard L., to Dresser Industries, Inc. Corrosion resistant pipe joint. 4,296,950, Cl. 285-45.000.

Champeau, Marcel; and Tabutin, Andre, to Societe Anonyme dite: Ramo S.A. Clamping device for simultaneously machining internally and/or externally, the two ends of a workpiece. 4,296,658, Cl. 82-30.000.

Chan, Tsiu C.: *See—*
McKenny, Vernon C.; and Chan, Tsiu C., 4,297,721, Cl. 357-59.000.

Chandler, Edward A., to Kaufel Group Ltd. Emergency lighting system. 4,297,614, Cl. 315-86.000.

Chandler, Ollie W.: *See—*
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., 4,297,443, Cl. 521-129.000.

Chang, Yun-Feng; Oene, Henk V.; and Beckwith, Elaine C., to Ford Motor Company. Coating composition of aminoplast, hydroxy polymers and vinylic monomers. 4,297,448, Cl. 525-162.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., 4,297,388, Cl. 427-47.000.

Charlton, Webster T., to Stone & Webster Engineering Corp. Apparatus and process for lubricating electrical cable. 4,296,837, Cl. 184-15.00R.

Charrier, Denis: *See—*
Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, 4,297,466, Cl. 526-218.000.

Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy. Folding door or like closure device. 4,296,791, Cl. 160-206.000.

Chef-Reddy Foods Corporation: *See—*
Harney, David L.; and Young, Harlow S., 4,297,377, Cl. 426-438.000.

Chemische Fabrik Stockhausen & Cie: *See—*
Chmelir, Miroslay; and Dahmen, Kurt, 4,297,468, Cl. 526-276.000.

Chemische Werke Huels, Aktiengesellschaft: *See—*
Maahs, Gunther; and Rombusch, Konrad, 4,297,505, Cl. 560-219.000.

Chen, Cheng-Lin, to Westinghouse Electric Corp. Isotopic separation. 4,297,191, Cl. 204-193.000.

Chen, Rocky W.: *See—*
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Chenaux, Bernard; and Leroux, Alain, to Compagnie Generale d'Electricite. Electrode for a lead accumulator. 4,297,420, Cl. 429-217.000.

Chern, Mao-Jin; and Lowrey, Robert D., to Minnesota Mining & Manufacturing Company. Liquid crystal display and photopolymerizable sealant therefor. 4,297,401, Cl. 428-1.000.

Chesebrough-Pond's Inc.: *See—*
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.

Chestnut, Benjamin F., to Emhart Industries, Inc. Miniature timing mechanism. 4,297,547, Cl. 200-38.00R.

Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, to Techinter S.A. Photosetting adhesive from unsaturated oligomer, photoinitiator, and betaine-forming mixture of unsaturated tert.amine and unsaturated acid. 4,297,185, Cl. 204-159.150.

Chevron Research Company: *See—*
Clark, William J., 4,296,523, Cl. 15-415.00R.
Edwards, Laroy H., 4,297,124, Cl. 71-66.000.

Chiang, David. Method of determining operating currents for stepping motor. 4,297,626, Cl. 318-696.000.

Chiasson, Bertrand A., to Union Carbide Corporation. Process for preparing alkali metal salts 3-amino-2, 5-dichlorobenzoic acid. 4,297,509, Cl. 562-456.000.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,296,663, Cl. 84-1.010.

Chicago Bridge & Iron Company: *See—*
Allo, Vincent F., 4,296,612, Cl. 62-123.000.
O'Meara, David M., 4,297,037, Cl. 366-114.000.

Chien-Sheng, Chiang. Stepless controlled flush closet. 4,296,505, Cl. 4-324.000.

Chik, Kiuchi D.: *See—*
Dyment, John C.; and Chik, Kiuchi D., 4,297,651, Cl. 331-94.50H.

Chion, Pierre: *See—*
Achard, Georges; Chion, Pierre; and Menault, Jacques, 4,297,412, Cl. 428-370.000.

Chisso Corporation: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.

Chmelir, Miroslay; and Dahmen, Kurt, to Chemische Fabrik Stockhausen & Cie. Allyl amido phosphorous copolymers. 4,297,468, Cl. 526-276.000.

Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, to Merck & Co., Inc. 7-α-Methoxy cephalosporins. 4,297,488, Cl. 544-21.000.

Christian, John H.: *See*—
Andresen, Rolf; and Christian, John H., 4,297,737, Cl. 360-135.000.
Christian, Robert F., to Jude Engineering, Inc. Inclined helical flight conveyor. 4,297,208, Cl. 210-94.000.
Ciba-Geigy Corporation: *See*—
Abeler, Gerd; and Maul, Rudolf, 4,297,268, Cl. 260-45.80N.
Burdeska, Kurt; and Kabas, Guglielmo, 4,297,234, Cl. 252-301.240.
Felder, Louis; and Kirchmayr, Rudolf, 4,297,513, Cl. 568-43.000.
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.
Kern, Jorg; and Guth, Christian, 4,297,400, Cl. 427-389.000.
Koci, Zdenek; and Mollet, Hans, 4,297,100, Cl. 8-527.000.
Rajappa, Srinivasachari; and Sudarsanam, Vasudevan, 4,297,365, Cl. 424-270.000.
Rasberger, Michael; Rosenberger, Siegfried; and Evans, Samuel, 4,297,492, Cl. 544-211.000.
CIR - S.p.A. Divisione SASIB: *See*—
Cristiani, Athos, 4,296,660, Cl. 83-100.000.
Claassen, Peter; List, Helmut; and Zeiringer, Rudolf, to List, Hans. Transducer device for measuring the internal pressure in pipes. 4,296,635, Cl. 73-730.000.
Claffy, Richard D.; and Lovelace, Reginald B., to United States of America, Navy. Quiet impulse steam trap. 4,296,771, Cl. 137-110.000.
Clarion Co., Ltd.: *See*—
Tanaka, Kouichi; and Amazawa, Kiyoshi, 4,297,645, Cl. 330-280.000.
Clark, Michael J.: *See*—
Ford, William D.; and Clark, Michael J., 4,297,203, Cl. 208-74.000.
Clark, William J., to Chevron Research Company. Dust-collection head for a dust collection system. 4,296,523, Cl. 15-415.00R.
Claude, Matte, to Centre National de Transfusion Sanguine. Method of detecting or identifying virus antigens, erythrocyte or cell antigens or antibodies in a biological medium. 4,297,104, Cl. 23-230.00B.
Clement, Joseph, to Mead Corporation, The. Display device with price change cartridges. 4,296,563, Cl. 40-518.000.
Clifford, Roy, to Kangol Magnet Limited. Emergency release systems. 4,296,942, Cl. 280-803.000.
Cluff, C. Brent. Tracking booster and multiple mirror concentrator floating collector. 4,296,731, Cl. 126-424.000.
CMI Corporation: *See*—
Van Wassenhove, Bernard, 4,296,941, Cl. 280-423.00B.
Coal Industry (Patents) Limited: *See*—
Bennett, Stuart C., 4,296,831, Cl. 181-224.000.
Coca-Cola Company, The: *See*—
Barrash, Marshall J., 4,296,861, Cl. 206-428.000.
Coe, Charles D.; and Wright, Philip, to Land Pyrometers Limited. Radiation detection of gas compositions. 4,297,577, Cl. 250-343.000.
Cohen, Louis, to B. F. Goodrich Company, The. Coating polymerization reactors with the reaction products of thiodiphenols and a bleach. 4,297,320, Cl. 422-131.000.
Cohen, Merrill L. Automotive oil system. 4,296,838, Cl. 184-106.000.
Coleman, Richard L.: *See*—
Witte, Arnold C.; and Coleman, Richard L., 4,297,227, Cl. 252-18.000.
Colleoni, Alec: *See*—
Mezrich, Reuben S.; Colleoni, Alec; and Lyons, David J., 4,297,009, Cl. 352-86.000.
Colombo, Angelo, to Valli & Colombo S.p.A. Cam operated lock, particularly for doors. 4,296,956, Cl. 292-169.180.
Commissariat a l'Energie Atomique: *See*—
Laval, Michel; and Tournier, Edmond, 4,297,576, Cl. 250-336.000.
Sauvage, Henri; and Tarnero, Maurice, 4,297,324, Cl. 422-268.000.
Communications Satellite Corporation: *See*—
Stegens, Ronald E., 4,297,661, Cl. 333-204.000.
Compagnie Generale d'Electricite: *See*—
Chenaux, Bernard; and Leroux, Alain, 4,297,420, Cl. 429-217.000.
Compagnie Honeywell Bull: *See*—
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., 4,297,743, Cl. 364-200.000.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See*—
Dupont, Jean M., 4,297,623, Cl. 318-410.000.
Concha, Edward; Jaffe, Max; and Bedford, Riley, to United States of America, Army. Cargo container transporter. 4,297,068, Cl. 414-458.000.
Conoco Inc.: *See*—
Stalder, John L.; and Martin, William L., 4,296,814, Cl. 166-303.000.
Consiglio Nazionale Delle Richerche: *See*—
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.
Conway, William H.: *See*—
Tyler, Hugh J.; and Conway, William H., 4,297,557, Cl. 219-10.55R.
Conwed Corporation: *See*—
Sherman, Norman; and Cameron, John H., 4,297,311, Cl. 264-109.000.
Cook, Edward H., Jr.: *See*—
Lazarz, Christine A.; and Cook, Edward H., Jr., 4,297,196, Cl. 204-296.000.
Cooper, George H., to Suntime, Inc. Solar hot water heating system. 4,296,729, Cl. 126-421.000.
Cooper Industries, Inc.: *See*—
Jameson, James J., 4,296,645, Cl. 74-688.000.
Cooper, Thomas F. Sky seat safety descent apparatus. 4,296,836, Cl. 182-193.000.
Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Compositions of epichlorohydrin rubber and nylon. 4,297,453, Cl. 525-408.000.
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, to Snamprogetti S.p.A; and Anic S.p.A. Polymerization of monoolefins using an aluminum-titanium catalyst system. 4,297,462, Cl. 526-125.000.
Cordes, Gunter: *See*—
Sandrock, Klaus; and Cordes, Gunter, 4,297,286, Cl. 260-347.800.
Cornelius, Morris E. Motorcycle throttle gripper. 4,296,643, Cl. 74-531.000.
Corning Glass Works: *See*—
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.
Brezinski, Donald P.; and Morse, Leroy R., 4,297,193, Cl. 204-195.00G.
Lawless, William N., 4,296,607, Cl. 62-6.000.
Lawless, William N., 4,296,608, Cl. 62-6.000.
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., 4,297,337, Cl. 424-1.000.
Paisley, Robert J., 4,297,140, Cl. 428-310.000.
Wu, Che-Kuang, 4,297,417, Cl. 428-410.000.
Cornish, William D.: *See*—
Tucker, Trevor W.; and Cornish, William D., 4,297,648, Cl. 331-1.00R.
Corona, Stephen C., to Xerox Corporation. Fluorescent lamp with incandescent ballasting systems. 4,297,616, Cl. 315-179.000.
Cortorillo, Salvatore F., to Wagner Electric Corporation. Control of tungsten filament erosion in a halogen lamp. 4,297,611, Cl. 313-222.000.
Corvino, Janice E.: *See*—
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.
Costantini, Michel; and Jouffret, Michel, to Rhone-Poulenc Industries. Production of epoxides from lower alkane-1,2-diols. 4,297,287, Cl. 260-348.160.
Cowan, Kiplin D., to Phillips Petroleum Co. Synthesis of esters. 4,297,506, Cl. 560-246.000.
CPC International Inc.: *See*—
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Mise, Yoshinari; and Tomimura, Eijiro, 4,297,146, Cl. 127-60.000.
Crabere, Henri: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.
Craven, Richard L., to Upjohn Company, The. Controlled release cycloheximide compositions. 4,297,339, Cl. 424-19.000.
Crawford, Roger A.; and Simmons, Robert B., to PPG Industries, Inc. Method of decomposing hypochlorite ion in a basic solution. 4,297,333, Cl. 423-241.000.
Cristiani, Athos, to CIR - S.p.A. Divisione SASIB. Device for feeding rod-like articles. 4,296,660, Cl. 83-100.000.
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude Procedes Georges Claude. Method of preparing stable dilute solutions of aliphatic carboxylic peracids, and the resulting solutions. 4,297,298, Cl. 260-502.00R.
Crone, William F., Jr.: *See*—
Reed, Ronald R.; Crone, William F., Jr.; and Meyer, G. Robert, 4,296,662, Cl. 83-880.000.
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, to University of California, The Regents of the. Method and apparatus for mapping lines of nuclear density within an object using nuclear magnetic resonance. 4,297,637, Cl. 324-309.000.
Crosby, Jeffrey N., to International Nickel Company, Inc., The. Ruthenium electroplating and baths and compositions therefor. 4,297,178, Cl. 204-47.000.
Crow, James T.: *See*—
Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, 4,297,615, Cl. 315-111.210.
Cryer, Edward: *See*—
Tregurtha, Steven J.; and Cryer, Edward, 4,297,549, Cl. 200-61.270.
CTS Corporation: *See*—
Flanders, Thomas W., 4,297,671, Cl. 338-200.000.
Cuccolo, Sergio: *See*—
Sachetto, Jean-Pierre; and Cuccolo, Sergio, 4,297,137, Cl. 106-15.050.
Cundari, Sante M.: *See*—
Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M., 4,297,303, Cl. 264-3.00R.
Cunningham, Joel, to Baxter Travenol Laboratories, Inc. Maintaining the dimensional integrity of thermoplastic tubing ends for receiving a luer. 4,297,316, Cl. 422-1.000.
Curtil, Remi; and Devaux, Alain, to Societe d'Etudes de Machines Thermiques S.E.M.T. Apparatus for external cooling of an exhaust valve. 4,296,715, Cl. 123-90.150.
Cusick, Kenneth M., to Aitken, Inc. Apparatus for separating foreign matter from a gas stream. 4,297,116, Cl. 55-319.000.
Custom Rollforming Company Limited: *See*—
Berdan, Gunter, 4,296,587, Cl. 52-788.000.
Cyber Diagnostics, Inc.: *See*—
Dunning, Ted E.; and Enright, Paul L., 4,296,756, Cl. 128-716.000.
Cybernet Electronics Corp.: *See*—
Kakigi, Takao, 4,297,688, Cl. 340-630.000.

D.E.W. Line, Inc.: *See*—
Fruchey, Russell L.; and Kupar, Daniel E., 4,297,672, Cl. 340-23.000.

Dachtler, William G. baby bottle support jig. 4,296,902, Cl. 248-102.000.

Dahmen, Kurt: *See*—
Chmelir, Miroslay; and Dahmen, Kurt, 4,297,468, Cl. 526-276.000.

Daiichi Seiyaku Co., Ltd.: *See*—
Miki, Tosaku; and Asano, Masahide, 4,297,357, Cl. 424-251.000.

Daimler-Benz Aktiengesellschaft: *See*—
Wulf, Helmut, 4,296,796, Cl. 165-46.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.

Daiwa Chemical Company Ltd.: *See*—
Nakaoji, Kozo, 4,297,520, Cl. 568-426.000.

Dake Corporation, Division of JSJ Corporation: *See*—
Kruse, Gary L., 4,296,589, Cl. 53-300.000.

D'Alelio, Gaetano F., deceased: *See*—
Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased, 4,297,467, Cl. 526-259.000.

Dalhof, Axel; and Lechner, Robert, to Siemens Aktiengesellschaft. Circuit for suppressing noise influences in the evaluation of signal states on transmission lines. 4,297,531, Cl. 179-16.0AA.

Dalle & Cie, S.A.: *See*—
Dalle, Joel, 4,297,156, Cl. 156-93.000.

Dalle, Joel, to Dalle & Cie, S.A. Process for manufacture of wall coverings and wall coverings thus obtained. 4,297,156, Cl. 156-93.000.

Dana Corporation: *See*—
Schetter, Thomas C., 4,296,642, Cl. 74-475.000.

Danavox A/S: *See*—
Pedersen, Jorgen R., 4,296,829, Cl. 181-129.000.

Danfoss A/S: *See*—
Jensen, Borge R., 4,297,608, Cl. 310-335.000.

Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, to Centro Ricerche Fiat S.p.A.; and Consiglio Nazionale Delle Richerche. Process for the electrolytic coating of conductive substrates with protective films of phenolic resins. 4,297,188, Cl. 204-181.00R.

Dargatz, Dayton O., to Plessey Peripheral Systems. Impact printer inclined ribbon scanner. 4,297,043, Cl. 400-224.000.

Darner, Ronald G., to Emhart Industries, Inc. Switching means for a timing mechanism. 4,297,545, Cl. 200-38.00R.

Dart Industries Inc.: *See*—
Elias, Moenes L.; and Shah, Narendra K., 4,297,257, Cl. 260-29.60H.

Das, Dilip K.: *See*—
Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., 4,297,388, Cl. 427-47.000.

Dasher, George F.; and Schamper, Thomas J., to Alberto-Culver Company. Method for gradual coloring of hair to a light brown shade and preparations for use therein. 4,297,098, Cl. 8-412.000.

Datakey, Inc.: *See*—
Flies, William P., 4,297,569, Cl. 235-443.000.

Datamedix Inc.: *See*—
Judell, Neil H. K., 4,296,755, Cl. 128-705.000.

David Parr & Associates Limited: *See*—
Parr, David, 4,297,565, Cl. 219-522.000.

Davidson, Donald R.; and Marsh, Walter H. W., to Singer Company, The. Button attaching hand tool with button storage compartment. 4,296,698, Cl. 112-110.000.

Davies, John H.: *See*—
Davis, Royston H.; and Davies, John H., 4,297,496, Cl. 544-332.000.

Davis, Gerald T.: *See*—
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,296,947, Cl. 282-27.500.

Davis, Michael W.: *See*—
Simpson, Harold G.; and Davis, Michael W., 4,296,582, Cl. 52-590.000.

Davis, Robert B., to Union Carbide Corporation. Liquid cryogen delivery system. 4,296,610, Cl. 62-55.000.

Davis, Royston H.; and Davies, John H., to Shell Oil Company. Nitrimine derivatives. 4,297,496, Cl. 544-332.000.

Day, Ralph R.; and Wulff, B. James, to Caterpillar Tractor Co. Contoured cable roller. 4,296,917, Cl. 254-400.000.

Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M. Preparation and reaction of energy producing waste material composition. 4,297,303, Cl. 264-3.00R.

Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., to United States of America, Army. Rocket tube launcher with cast-in place tube support bulkhead. 4,296,669, Cl. 89-1.816.

Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912B nucleus. 4,297,277, Cl. 260-112.50R.

Dec, Anthony F.: *See*—
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.

Deere & Company: *See*—
Marquart, Gordon L., 4,296,649, Cl. 74-751.000.

Deguchi, Ryuichi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.

Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, to Toray Industries, Inc. Surface treatment of plastic material. 4,297,187, Cl. 204-165.000.

Degussa Aktiengesellschaft: *See*—
Kleinschmit, Peter; and Schwarz, Rudolf, 4,297,143, Cl. 501-103.000.
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, 4,297,145, Cl. 106-308.00Q.

Dejneka, Tamara: *See*—
Sundeen, Joseph E.; and Dejneka, Tamara, 4,297,275, Cl. 260-112.50R.

De Koch, Robert J.; Kolb, Gerald C.; and Lalk, James W., to Dow Chemical Company, The. Process for the manufacture of oxazoline and/or oxazine-modified adsorbent polymer resins. 4,297,452, Cl. 525-367.000.

Delavarenne, Serge Y.; Dubreux, Bernard; and Tellier, Pierre, to P C U K Produits Chimiques Ugine Kuhlmann. 5-Amino-1,2,3,4-tetrahydroanthraquinone and its preparation. 4,297,288, Cl. 260-378.000.

Delfosse, Claude, to Fives-Cail Babcock. Centrifugal separator. 4,297,210, Cl. 210-107.000.

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Papalos, John G.; and Kavchok, Ronald W., 4,297,259, Cl. 260-29.6NR.

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Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

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Donham, Robert E.; and Heimbold, Richard L., to Lockheed Corporation. Wind turbine. 4,297,076, Cl. 416-37.000.
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McDonald, Charles J., 4,297,256, Cl. 260-29.4UA.
Moore, Zack J., 4,297,640, Cl. 324-458.000.
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Dukes, Jesse M. Agricultural crop cover. 4,296,568, Cl. 47-20.000.
Dunbar, Glenn G. Weight transfer apparatus. 4,297,071, Cl. 414-542.000.
Dunlop Limited: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Phillips, Thomas R., 4,297,262, Cl. 260-31.600.
Soboczenski, Edward J., 4,297,370, Cl. 424-298.000.
Dupont, Jean M., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. System for controlling a separately excited constant load DC electric motor. 4,297,623, Cl. 318-410.000.
Dupressoir, Albert, to Thomson-CSF. Parallel-plane antenna with rotation of polarization. 4,297,710, Cl. 343-756.000.
Duracell International Inc.: *See—*
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Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, 4,297,502, Cl. 560-35.000.
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E-Systems, Inc.: *See—*
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Eadie Brian K. M., to Eadie Bros. & Co. Limited. Textile combing roller. 4,296,527, Cl. 19-112.000.
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Eastman Kodak Company: *See—*
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Eber, Nicholas. Absorption refrigerator. 4,296,613, Cl. 62-515.000.
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, to Iwatsu Electric Co., Ltd. Exposure device of an electrographic copying apparatus. 4,297,024, Cl. 355-14.00E.
EC Erdolchemie GmbH: *See—*
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Eckert, Kim, to Motorola, Inc. Schmitt trigger. 4,297,596, Cl. 307-279.000.
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., to International Minerals & chemical Corporation. Method for polyurethane foam using a tri-tertiary amine catalyst. 4,297,443, Cl. 521-129.000.
Edel, Hans J., to Drabert Sohne Minden. Actuator button apparatus for adjustable chairs. 4,296,903, Cl. 248-162.100.
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Edwards, Bryant, to Illinois Tool Works Inc. Nestable and stackable transplanting system. 4,296,569, Cl. 47-73.000.
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Eicher, Theobald; and Muller, Friedemann, to Bayer Aktiengesellschaft. Smokable products. 4,296,762, Cl. 131-359.000.
Eidenschink, Rudolf; and Pohl, Ludwig, to Merck Patent Gesellschaft mit Beschrankter Haftung. Diketones useful as liquid crystals. 4,297,515, Cl. 568-329.000.
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Ekstrom, Hans. Omnidirectional receiving antenna. 4,297,711, Cl. 343-794.000.
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Elias, Moenes L.; and Shah, Narendra K., to Dart Industries Inc. Metal stripping composition and method. 4,297,257, Cl. 260-29.60H.
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EMI Limited: *See—*
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Engelhard Minerals & Chemicals Corporation: *See—*
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Enomoto, Yutaka: *See—*
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Environmental Devices Corporation: *See—*
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Gamm, Robert J., 4,296,559, Cl. 36-136.000.

Eppich, Helmut, to EBCO Industries, Ltd. Manually operable magnetic card reader and magnetic head assembly therefor. 4,297,735, Cl. 360-104.000.

Epstein, Barry M.; and Gernstein, Terry M. Pushbutton telephone set disabling means. 4,297,534, Cl. 179-90.00D.

Erickson, Erick E.; Katzman, Allison W.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Method and apparatus for making doll clothing and doll house accessories. 4,297,153, Cl. 156-63.000.

Ermebrant, Lennart C.: *See—*
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Ernst, Richard J., to Illinois Tool Works Inc. Driver bit attachment. 4,296,656, Cl. 81-429.000.

Ertel, Werner, to Bayer Aktiengesellschaft. Process for the preparation of 2-nitrobenzaldehyde. 4,297,519, Cl. 568-424.000.

Erwin, Galen B.: *See—*
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Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Preparation of 2-isopropylamino pyrimidine. 4,297,495, Cl. 544-330.000.

Escobosa, Alfonso S. Hydraulic controlled sonic induction system. 4,296,911, Cl. 251-57.000.

Estes, John H.: *See—*
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Fairbanks, Thomas L. Telephone security attachment. 4,297,539, Cl. 179-189.00D.

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Falkenbach, Guenther, to Braun AG. Electric blender. 4,297,038, Cl. 366-206.000.

Farmer, Marior R., to Aluma Form, Inc. Electrical equipment mount. 4,296,904, Cl. 248-218.400.

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Farrant, David J. R., to Automotive Products Limited. Ball and socket joint. 4,297,047, Cl. 403-138.000.

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Faure, Jean-Louis. Apparatus for providing false twist to moving yarn. 4,296,598, Cl. 57-284.000.

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Felder, Donald W. Polish rod jack system. 4,296,678, Cl. 92-13.100.

Felder, Louis; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Process for the preparation of benzophenone thioethers. 4,297,513, Cl. 568-43.000.

Feldman, Nicholas, to Exxon Research & Engineering Co. Zirconium additives for residual fuel oil. 4,297,110, Cl. 44-66.000.

Feldstein, Nathan. Catalytic promoters in electroless plating catalysts in true solutions. 4,297,397, Cl. 427-304.000.

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Fett, Helen M.: *See—*
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Finan, Thomas P.: *See—*
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Fine, Jerry W.: *See—*
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Fine, Louis B.: *See—*
Pontifex, Edward J., 4,296,749, Cl. 128-283.000.

Finke, Ulrich; and Moretto, Hans-Heinrich, to Bayer Aktiengesellschaft. Conversion of low-boiling constituents from alkyl-chlorosilane synthesis. 4,297,500, Cl. 556-466.000.

Fischer, Michael A., to Grinnell Fire Protection Systems Company, Inc. Horizontal sprinkler deflector with flow lifting formation. 4,296,816, Cl. 169-37.000.

Fischer & Porter Co.: *See—*
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Flanders, Thomas W., to CTS Corporation. Tandem insert molded electrical controls and process for producing same. 4,297,671, Cl. 338-200.000.

Fletcher, Augustus; and Moriarty, William L., to American Chemical & Refining Company Incorporated. Method and composition for electrodepositing palladium/nickel alloys. 4,297,177, Cl. 204-43.00N.

Fleury, James C., to Ex-Cell-O Corporation. Accessory clearance hole. 4,296,805, Cl. 165-151.000.

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Arnold, Harmon W.; and Erwin, Galen B., 4,297,418, Cl. 428-595.000.

Flies, William P., to Datakey, Inc. Microelectronic memory key with receptacle and systems therefor. 4,297,569, Cl. 235-443.000.

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Floessel, Klaus: *See—*
Floessel, Carl D.; and Floessel, Klaus, 4,297,523, Cl. 174-27.000.

Flood, John B.: *See—*
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.
Focke & Co.: *See—*
Focke, Heinz, 4,296,590, Cl. 53-531.000.
Focke, Heinz, to Focke & Co. Method and apparatus for conveying six-pack containers to carton blank. 4,296,590, Cl. 53-531.000.
Folonari, Carlo: *See—*
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.
Fong, Harry H. S.: *See—*
Waller, Donald P.; Zaneveld, Lourens J. D.; and Fong, Harry H. S., 4,297,341, Cl. 424-80.000.
Ford Motor Company: *See—*
Chang, Yun-Feng; Oene, Henk V.; and Beckwith, Elaine C., 4,297,448, Cl. 525-162.000.
Giardini, Dante S., 4,297,089, Cl. 417-437.000.
May, James I., 4,296,641, Cl. 74-422.000.
Ford, William D.; and Clark, Michael J., to Standard Oil Company (Indiana). Apparatus for the catalytic cracking of hydrocarbons. 4,297,203, Cl. 208-74.000.
Forenade Fabriksverken: *See—*
Hammar, Jan E., 4,296,767, Cl. 134-15.000.
Fork, Frank W., to H. H. Robertson Company. Electrical activating assembly and receptacle support means therefor. 4,297,524, Cl. 174-48.000.
Forrester, A. Theodore: *See—*
Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, 4,297,615, Cl. 315-111.210.
Forsman, Lars O. Device for transmitting linear measuring motion. 4,296,975, Cl. 308-6.00R.
Foster, Alan I.; Sims, Malcolm L.; and Young, Dennis, to British Petroleum Company Limited, The. Protective metal oxide films on metal or alloy substrate surfaces susceptible to coking, corrosion or catalytic activity. 4,297,150, Cl. 148-6.300.
Foster, Perry A., Jr., to Aluminum Company of America. Electrolytic production of metal. 4,297,180, Cl. 204-67.000.
Fowler, James C.; Hale, Steven D.; and Moser, Theodore E., to Ensco, Inc. Radar drill guidance system. 4,297,699, Cl. 343-5.0NA.
Fowler, Kenneth A.: *See—*
Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., 4,297,607, Cl. 310-334.000.
Fox, Roland T. V.: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.
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Leclercq, Joseph, 4,297,170, Cl. 376-442.000.
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., to United States of America, Air Force. Energetic monopropellant. 4,297,152, Cl. 149-88.000.
Franklin, Benjamin S.: *See—*
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., 4,297,743, Cl. 364-200.000.
Franklin Electric Co., Inc.: *See—*
Schaefer, Edward J., 4,297,627, Cl. 318-778.000.
Franz, Karl; and Schonfeld, Bernd, to Riedel-de Haen Aktiengesellschaft. Process for the preparation of a red emitting phosphor coated with red iron oxide and its application. 4,297,390, Cl. 427-64.000.
Frazier, Stephen E., to Rush-Hampton Industries, Inc. Composition and method for the treatment of acne. 4,297,348, Cl. 424-180.000.
Frederiksen, Jeffrey E., to Bally Manufacturing Corporation. TV Game apparatus. 4,296,930, Cl. 273-313.000.
Freed, Donald L., Jr., to National Mine Service Company. Material gathering device for a mining machine. 4,296,856, Cl. 198-514.000.
Freitag, Dieter: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.
Frerking, Marvin E., to Rockwell International Corporation. Closed loop temperature compensated frequency reference. 4,297,657, Cl. 331-176.000.
Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Method and device for locating a sound event on a magnetic tape. 4,297,732, Cl. 360-72.100.
Fricke, Gunter: *See—*
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.
Friedman, Jack S.: *See—*
Schmitt, Wilhelm E., 4,296,519, Cl. 15-184.000.
Fries, James E. Solar lighting system. 4,297,000, Cl. 350-96.240.
Froehlich, Helmut: *See—*
Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, 4,297,493, Cl. 544-241.000.
Frohlich, Horst: *See—*
Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, 4,297,236, Cl. 252-389.00R.
Fruchey, Russell L.; and Kupar, Daniel E., to D.E.W. Line, Inc. Early warning system for approaching transportation vehicles. 4,297,672, Cl. 340-23.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 2,2-dimethyl-3-(2-fluoroalkyl-2-oxy-vinyl)-cyclopropane-carboxylic acid esters. 4,297,366, Cl. 424-274.000.
Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with (±)-trans-3-(E/Z-2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-(α-cyano-3-phenoxy-4-fluoro-benzyl) ester and the individual E- and Z-isomers. 4,297,371, Cl. 424-304.000.
Fuji Kiko Co., Ltd.,: *See—*
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,296,944, Cl. 280-804.000.
Fuji Photo Film Co., Ltd.: *See—*
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, 4,297,440, Cl. 430-505.000.
Higashi, Akio; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,297,392, Cl. 427-75.000.
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, 4,297,235, Cl. 252-316.000.
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, 4,297,436, Cl. 430-310.000.
Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, 4,297,384, Cl. 427-14.100.
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 4,297,470, Cl. 526-304.000.
Takehara, Nobumitsu; and Isayama, Shogo, 4,297,396, Cl. 427-284.000.
Fujii, Etsuo: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.
Fujii, Kenji, to Yoshida Iron Works Co., Ltd. Method and means for adding treating agent for molten metal. 4,297,133, Cl. 75-53.000.
Fujii, Shuzo; and Sato, Yoshikatsu, to Nippon Electric Co., Ltd. Temperature compensated crystal oscillator. 4,297,655, Cl. 331-116.00R.
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, to Toyo Jozo Kabushiki Kaisha. Aminoglycoside antibiotic G-367-1 and method for the production thereof. 4,297,486, Cl. 536-17.00R.
Fujii, Takashi: *See—*
Kizaki, Jiro; and Fujii, Takashi, 4,296,604, Cl. 60-562.000.
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Pipe coupling and pipe joint connection. 4,296,954, Cl. 285-331.000.
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Antirattle spring for a disc brake of vehicles. 4,296,841, Cl. 188-73.380.
Fujisawa Pharmaceutical Co. Ltd.: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Fujitsu Fanuc Limited: *See—*
Komiya, Hidetsugu, 4,297,624, Cl. 318-594.000.
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Nagahama, Tsutomu; and Ishihara, Michio, 4,297,722, Cl. 357-74.000.
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Interfacing circuit status detection arrangement in a telephone exchange. 4,297,532, Cl. 179-18.0AB.
Fukuoka, Yohei: *See—*
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.
Fumagalli, Angelo: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.
Furrier, Joseph P.; and Gilbert, Allan H., to Lever Brothers Company. Toothbrush and gum massaging accessory. 4,296,518, Cl. 15-110.000.
Furuhashi, Toshio; and Abe, Osamu, to Hitachi, Ltd. Control apparatus for an internal combustion engine. 4,296,722, Cl. 123-492.000.
Furukawa, Takashi: *See—*
Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, 4,296,919, Cl. 266-111.000.
Furukawa, Takeshi: *See—*
Misaka, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, 4,296,864, Cl. 209-144.000.
Furukawa, Yukio: *See—*
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Furusawa, Kahei: *See—*
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Furutachi, Nobuo: *See—*
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, 4,297,440, Cl. 430-505.000.
Furutani, Toshinobu: *See—*
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.
Fuzzell, Joe E., to Caterpillar Tractor Co. Leak detection apparatus. 4,297,687, Cl. 340-626.000.
G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,297,487, Cl. 542-412.000.
Raymond, Christopher D., 4,296,745, Cl. 128-156.000.
G & W Electric Specialty Company: *See—*
Rueth, William R., Jr., 4,297,554, Cl. 200-153.0SC.
Gaertner, Friedheim: *See—*
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.
Gaines, Jack R.: *See—*
Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, 4,297,125, Cl. 71-77.000.

Galaspie, Charles E. Light producing device. 4,297,617, Cl. 315-326.000.

Gale, James A., to Kenneth E. Beswick Ltd. Thermal cut-outs and to the method of assembling a multiplicity of such thermal cut-outs. 4,297,669, Cl. 337-407.000.

Gallagher, David A., to Bunker Ramo Corporation. Electrical connector assembly. 4,296,992, Cl. 339-186.00M.

Gallenkamp, Bernd: *See—*
Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, 4,297,371, Cl. 424-304.000.

Gallet, Georges: *See—*
Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy, 4,296,791, Cl. 160-206.000.

Galley, Richard A.: *See—*
Bryant, David R.; and Galley, Richard A., 4,297,239, Cl. 252-412.000.

Galyan, Boris A.: *See—*
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Gambro AB: *See—*
Carlsson, Per-Olov A. V.; and Hakansson, Bo H., 4,296,760, Cl. 128-788.000.
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,296,633, Cl. 73-362.0AR.

Gamm, Robert J., to Envoys U.S.A., Inc. Athletic shoe pocket. 4,296,559, Cl. 36-136.000.

Gander, Jean-Gabriel; and Aubert, Ralph, to LGZ Landis & Gyr Zug AG. Detector to determine the presence of an electrical signal in the presence of noise of predetermined characteristics. 4,297,533, Cl. 179-84.0VF.

Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., to Farmitalia Carlo Erba S.p.A. Pharmaceutically useful 5,6-saturated PGI compounds. 4,297,368, Cl. 424-285.000.

Garbe, Dietmar R. Spirometers. 4,296,758, Cl. 128-728.000.

Garrett Corporation, The: *See—*
Burgmeier, Lyman R.; McCarty, Frederick B.; and Silver, Alexander, 4,296,544, Cl. 29-598.000.
McGowan, Peter T., 4,297,086, Cl. 417-271.000.

Garrett, Harold E., to United States of America, Army. Segmented sabot projectile. 4,296,687, Cl. 102-518.000.

Garrett, Robert W., to Western Electric Co., Inc. Method for removing heat from a workpiece during processing in a vacuum chamber. 4,297,190, Cl. 204-192.00E.

Gaughan, Edmund J.; and Kezerian, Charles, to Stauffer Chemical Company. N-(Benzenesulfonyl) thiocarbamates-herbicidal antidotes. 4,297,295, Cl. 260-455.00A.

Gebel, Josef: *See—*
Altmeyer, Hans J.; and Gebel, Josef, 4,297,215, Cl. 210-386.000.

Geisler, Irving: *See—*
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.

Gen-Tech, Inc.: *See—*
Tawse, Ian S., 4,297,604, Cl. 310-168.000.

General Atomic Company: *See—*
Taylor, Edward S.; and Hirschle, George W., 4,296,713, Cl. 122-32.000.

General Dynamics Corporation: *See—*
Pazmany, Ladislao, 4,296,895, Cl. 244-3.290.
Peller, Robert C.; and Dyer, Jack E., 4,296,839, Cl. 188-378.000.

General Electric Company: *See—*
Adamson, Arthur P., 4,296,599, Cl. 60-39.230.
Banucci, Eugene G.; and Boldebuck, Edith M., 4,297,385, Cl. 427-27.000.
Bloomer, Milton D.; and Kornrumpf, William P., 4,296,632, Cl. 73-362.0AR.
Griffin, James R.; and Schreck, Raymond M., 4,296,611, Cl. 62-89.000.
Grubb, Willard T., 4,297,168, Cl. 376-418.000.
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Hill, Michael S.; and Poff, David A., 4,296,546, Cl. 29-730.000.
Howell, Edward K., 4,297,741, Cl. 361-93.000.
Mullersman, Ferdinand H., 4,297,630, Cl. 320-35.000.
Northup, Robert P.; and Anderson, Robert L., 4,296,670, Cl. 89-43.00R.
Rodenbeck, Philip G.; and Koenig, Fredrick, 4,296,784, Cl. 140-92.200.
Seymour, Raymond K.; and Murphy, Frank H., 4,297,663, Cl. 335-20.000.
Shah, Siddharth A.; Woodcock, Sidney J.; and Fagan, Robert D., 4,297,072, Cl. 414-684.300.
Smearing, Robert W., 4,297,389, Cl. 427-58.000.
Stark, Charles J., Jr., 4,297,457, Cl. 525-507.000.
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Stevens, Francis J., 4,297,635, Cl. 324-156.000.
Verbicky, John W., 4,297,283, Cl. 260-346.300.
Williams, Frank J., III; and Relles, Howard M., 4,297,474, Cl. 528-170.000.

General Foods Corporation: *See—*
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.

General Instrument Corporation: *See—*
Smith, Kent F., 4,297,598, Cl. 307-355.000.

General Motors Corporation: *See—*
Aldrich, Frederic C., 4,296,723, Cl. 123-510.000.
Arndt, Frederick P., 4,296,847, Cl. 192-4.00A.
Baugh, Edward D.; and Hoffman, Mark B., 4,296,718, Cl. 123-198.00D.
Brucken, Byron L., 4,297,085, Cl. 417-222.000.
Kosek, Thomas P.; and Steinhilper, Eric A., 4,296,888, Cl. 239-403.000.
Reider, Samuel B., 4,296,606, Cl. 60-754.000.
Staub, Vincent M., Jr., 4,296,854, Cl 192-106.100.

General Tire & Rubber Company, The: *See—*
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.

Georgeaux, Andre, to Societe Miniere et Metallurgique de Penarroya. Process for the treatment of solutions of lead chloride. 4,297,183, Cl. 204-117.000.

Gerber Products Company: *See—*
Spletzer, Barry L., 4,297,682, Cl. 340-384.00E.

Gernstein, Terry M.: *See—*
Epstein, Barry M.; and Gernstein, Terry M., 4,297,534, Cl. 179-90.00D.

Gholson, Wayne, to Varel Manufacturing Company. Cable tool with circulating drill stem. 4,296,823, Cl. 175-308.000.

Giacoletto, Glen: *See—*
Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, 4,297,125, Cl. 71-77.000.

Giacone, Felice: *See—*
Becchi, Raffaele; Giacone, Felice; and Accattino, Andrea, 4,297,573, Cl. 250-231.0SE.

Giardini, Dante S., to Ford Motor Company. Arcuate tubular pump. 4,297,089, Cl. 417-437.000.

Giba-Geigy Corporation: *See—*
Pfeifer, Josef; and Reinehr, Dieter, 4,297,480, Cl. 528-346.000.

Gibson, Willie M.: *See—*
Verable, Diara; and Gibson, Willie M., 4,296,575, Cl. 52-66.000.

Gidge, Kenneth N.; and Richard, Henry J., to BSL Corporation. Transparent reach-through curtain for open refrigerators. 4,296,792, Cl. 160-332.000.

Gies, Paul E., to Aeroquip Corporation. Cylinder cushion with contractable ring. 4,296,675, Cl. 91-396.000.

Giessen, Bill C.; Polk, Donald E.; and Ray, Ranjan, to Marko Materials, Inc. High strength iron, nickel and cobalt base crystalline alloys with ultrafine dispersion of borides and carbides. 4,297,135, Cl. 75-123.00B.

Gilbert, Allan H.: *See—*
Furrier, Joseph P.; and Gilbert, Allan H., 4,296,518, Cl. 15-110.000.

Gilbert, Richard J.; and Rice, Doris M., to Texaco Development Corp. Process for rim elastomers with superior high temperature dimensional stability. 4,297,444, Cl. 521-160.000.

Gillette, Donald J., to Electrostatic Equipment Corporation. Control grid in electrostatic fluidized bed coater. 4,297,386, Cl. 427-27.000.

Gist-Brocades N.V.: *See—*
van der Lugt, Arie, 4,296,769, Cl. 134-68.000.

Gjelsvik, Norvald; and Hundere, Ingleif, to Elkem-Spigerverket a/s. Method of producing a pure aluminiumoxide from solutions containing dissolved ions of aluminium and iron. 4,297,326, Cl. 423-126.000.

Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., to Elkem-Spigerverket A/S. Method of precipitation of pure aluminiumchloride from solutions which contain ions of aluminium and magnesium. 4,297,327, Cl. 423-126.000.

GKN-Stenman AB: *See—*
Widen, Bo G., 4,296,619, Cl. 70-451.000.

Glace, William R.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,297,266, Cl. 260-42.140.

Glaser, Helmut; and Schick, Ludwig, to Siemens Aktiengesellschaft. Device for monitoring lamp failure in airport navigation lighting. 4,297,632, Cl. 324-51.000.

Glazov, Vladimir G.: *See—*
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.

Glazunov, Sergei G.: *See—*
Yasinsky, Konstantin K.; Glazunov, Sergei G.; Ross, Jury N.; and Bykov, Igor D., 4,296,793, Cl. 164-24.000.

Gliewe, Russell H.: *See—*
Jaffin, Harry A.; and Gliewe, Russell H., 4,296,565, Cl. 42-1.00T.

Gmelch, John C. Highway guide post. 4,297,050, Cl. 404-10.000.

Godard, Pierre; and Billot, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Automatic switching arrangement for two batteries which are charged in parallel and discharged in series. 4,297,629, Cl. 320-7.000.

Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, to University of California, The Regents of the. High current density cathode structure. 4,297,615, Cl. 315-111.210.

Goerth, Joachim, to U.S. Philips Corporation. Crystal oscillator including a MOS-capacitor. 4,297,654, Cl. 331-108.00D.

Goldin, Rodion G.; and Yakimenko, Valentin G. Device for exciting synchronous machine. 4,297,739, Cl. 361-55.000.

Goldstein, Allan L.; and Low, Teresa L. K., to Hoffman-La Roche Inc. Thymosin beta 3 and beta 4. 4,297,276, Cl. 260-112.50R.

Good, Maynard: *See—*
Sidaway, H. John; and Good, Maynard, 4,296,891, Cl. 242-110.000.

Goodale, Robert H.; and DuJack, George M., Jr. Septum for use in gas chromatography and method of operation. 4,296,634, Cl. 73-864.860.

Goodall SemiMetallic Hose & Mfg. Co.: *See—*
Marshall, Don J., 4,297,079, Cl. 416-140.000.

Goodyear Tire & Rubber Company, The: *See*—
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.

Gorbunov, Nikolai M.: *See*—
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Goron, John, to Midland-Ross Corporation. Accumulator head used in the formation of a multi-layer parison. 4,297,092, Cl. 425-133.100.

Gotman, Alexander, to Presco, Inc. Control of small parts in a manufacturing operation. 4,296,542, Cl. 29-574.000.

Goto, Hiromi: *See*—
Kagata, Tooru; and Goto, Hiromi, 4,296,848, Cl. 192-35.000.

Goto, Jugo; and Saegusa, Takeo, to Takeda Chemical Industries, Ltd. Production of crosslinked polymers using an oxazoline derivative. 4,297,449, Cl. 525-329.000.

Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., to Bristol-Myers Company. 7-α-Amino-substituted acylamino-3-(1-carboxymethyltetrazol-5-ylthiomethyl)-3-cephem-4-carboxylic acids. 4,297,489, Cl. 544-27.000.

Goudin, Robert, to U.S. Philips Corporation. Support for a transducer for emitting and/or receiving ultrasonic signals in a given angular sector. 4,296,753, Cl. 128-660.000.

Gould Inc.: *See*—
Kozacka, Frederick J., 4,297,667, Cl. 337-251.000.

Graffin, Andre J., to Serac. Method and apparatus for heat-sealing lids on glass containers. 4,297,161, Cl. 156-583.300.

Graham, Richard H.: *See*—
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,296,809, Cl. 166-259.000.

Granatek, Alphonse P.: *See*—
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,297,489, Cl. 544-27.000.

Granger, Michel: *See*—
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, 4,297,298, Cl. 260-502.00R.

Gratzmuller, Jean L. Hydraulically controlled safety valve. 4,296,910, Cl. 251-28.000.

Gray, John C.: *See*—
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., 4,297,152, Cl. 149-88.000.

Great Lakes Chemical Corporation: *See*—
Macchiarolo, Nick T.; McGuire, Billy G.; and Scalise, John M., 4,297,224, Cl. 210-755.000.

Greco, Alberto: *See*—
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.

Green, David L., to Pacer Systems, Inc. Omnidirectional speed cockpit display. 4,297,673, Cl. 340-27.0NA.

Greenaway, David L.: *See*—
Antes, Gregor; and Greenaway, David L., 4,297,001, Cl. 350-129.000.

Greene, Del F.: *See*—
Little, Jane; and Greene, Del F., 4,296,677, Cl. 91-510.000.

Greenley, Henry R.: *See*—
Jureit, John C.; and Greenley, Henry R., 4,297,048, Cl. 403-189.000.

Gresch, Heinz: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,297,117, Cl. 55-389.000.

Grewatta Heinz: *See*—
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, 4,297,145, Cl. 106-308.00Q.

Griffin, James R.; and Schreck, Raymond M., to General Electric Company. Household refrigerator air flow control and method. 4,296,611, Cl. 62-89.000.

Grinnell Fire Protection Systems Company, Inc.: *See*—
Fischer, Michael A., 4,296,816, Cl. 169-37.000.
Mears, James W., 4,296,815, Cl. 169-37.000.

Griste, Charles R., to Hughes Tool Company. Cable tensioner for a downcrowding device for earth boring machines. 4,296,819, Cl. 173-147.000.

Grobler, Johannes H. Sealing of leaks in tanks and the like. 4,296,932, Cl. 277-1.000.

Grohmann, Andreas: *See*—
Moll, Hans-Georg; Hasselbarth, Ulrich; Grohmann, Andreas; and Marks, Helmut, 4,297,221, Cl. 210-702.000.

Grolig, Johann: *See*—
Becker, Robert; Grolig, Johann; and Rasp, Christian, 4,297,501, Cl. 560-24.000.

Groman, Ernest V.; and Cabelli, Michael D., to Baxter Travenol Laboratories, Inc. Xanthine tracers. 4,297,494, Cl. 544-267.000.

Gross, Franz; Boehme, Gerit; Wiehler, Wolf; and Bibracher, Wilhelm, to Siemens Aktiengesellschaft. Gas-tight-high-frequency permeable window arrangement in a coaxial line, particularly for traveling wave tubes. 4,297,662, Cl. 333-252.000.

Grossman, David G.: *See*—
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.

Grubb, Willard T., to General Electric Company. Nuclear fuel assembly and process. 4,297,168, Cl. 376-418.000.

Grubb, Willard T., to General Electric Company. Nuclear fuel assembly and process. 4,297,169, Cl. 376-418.000.

Grumman Aerospace Corporation: *See*—
Kress, Robert W.; and Bacchi, Anthony C., 4,296,896, Cl. 244-12.400.

Grummon, Glenn D.: *See*—
Vitello, John P.; and Grummon, Glenn D., 4,296,785, Cl. 141-105.000.

Grundmann, Edgard: *See*—
Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,296,772, Cl. 126-426.000.

Gruner & Jahr AG & Co.: *See*—
Wangermann, Jochen, 4,296,684, Cl. 100-292.000.

Gualandi, Paolo. Deodorizing composition for ash trays. 4,297,233, Cl. 252-259.500.

Guarnaschelli, Claudio. Aerator. 4,297,214, Cl. 210-219.000.

Gudze, Robert A.: *See*—
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.

Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix. Reusable heat devices containing xylitol as the heat-storage material. 4,296,801, Cl. 165-104.170.

Guigues, Francois; and Trinh, Stephane, to Rhone Poulenc Agrochemie. 2-Phenyl-4-pyrone derivatives, their preparation and their use as fungicides. 4,297,367, Cl. 424-283.000.

Guiler, Richard S., to E. J. Brooks Company. Adaptor for plunger lock operating tool. 4,296,616, Cl. 70-34.000.

Guiraud, Francois, to Fichet-Bauche. Lock and key device. 4,296,618, Cl. 70-358.000.

Gulbins, Erich: *See*—
Schenck, Hans-Uwe; and Gulbins, Erich, 4,297,255, Cl. 260-18.0PF.

Gulf Research & Development Company: *See*—
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,296,809, Cl. 166-259.000.
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,297,518, Cl. 568-385.000.

Gupta, Tapan K.; and Pietsch, Herbert E., to Westinghouse Electric Corp. Method of producing homogeneous ZnO non-linear powder compositions. 4,297,250, Cl. 252-518.000.

Gutehoffnungshutte Sterkrade A.G.: *See*—
von Petery, Curt, 4,297,083, Cl. 417-53.000.

Guth, Christian: *See*—
Kern, Jorg; and Guth, Christian, 4,297,400, Cl. 427-389.000.

Guthlein, Werner; Wielinger, Hans; Rittersdorf, Walter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Guaiaconic acid A from guaiac resin. 4,297,271, Cl. 260-107.000.

H. Berthold Aktiengesellschaft: *See*—
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, 4,297,044, Cl. 400-473.000.

H. H. Robertson Company: *See*—
Fork, Frank W., 4,297,524, Cl. 174-48.000.

Haack, Dennis A., to Denack Design Corporation. Structural component for upholstered furniture and method of making. 4,296,964, Cl. 297-218.000.

Haas, David J.: *See*—
Juner, Adolph; and Haas, David J., 4,297,580, Cl. 250-368.000.

Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, to Ciba-Geigy Corporation. Novel 4,7-phenanthroline derivatives and pharmaceutical compositions containing them and their use. 4,297,358, Cl. 424-256.000.

Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., to Pillsbury Company, The. Refrigerated shelf stable pie crust dough. 4,297,378, Cl. 426-532.000.

Hacker, Kurt: *See*—
Dokoupil, Jiri; and Hacker, Kurt, 4,296,514, Cl. 12-142.00R.

Haeussler, Ernst. Apparatus for forming recess around a pickup bolt of a concrete body. 4,296,909, Cl. 249-94.000.

Hafner-Milac, Natasa: *See*—
Suhac, Peter; Hafner-Milac, Natasa; and Dolenc, Bozidar, 4,297,293, Cl. 260-448.00B.

Haga, Ryooichi: *See*—
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,297,216, Cl. 210-613.000.

Hagberg, John E., to Westinghouse Electric Corp. Protective relaying apparatus. 4,297,740, Cl. 361-67.000.

Hahnefeld, Fedor: *See*—
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, 4,297,044, Cl. 400-473.000.

Hahnkamm, Volker: *See*—
Buxbaum, Gunter; Schopper, Heinrich-Christian; Leitner, Lutz; and Hahnkamm, Volker, 4,297,395, Cl. 427-127.000.

Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, to United States of America, Agriculture. Tree rooting using synthetic auxins. 4,297,125, Cl. 71-77.000.

Hakansson, Bo H.: *See*—
Carlsson, Per-Olov A. V.; and Hakansson, Bo H., 4,296,760, Cl. 128-788.000.

Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., to Gambro AB. Device for temperature measurement. 4,296,633, Cl. 73-362.0AR.

Hakoi, Tsutomu, to Yoshida Kogyo K.K. Apparatus for loading a pull tab on a slider body. 4,296,547, Cl. 29-766.000.

Hale, Steven D.: *See*—
Fowler, James C.; Hale, Steven D.; and Moser, Theodore E., 4,297,699, Cl. 343-5.0NA.

Hales, Marwood J.; and Thorpe, Cameron L. Apparatus for extracting energy from water waves. 4,296,602, Cl. 60-398.000.

Halford, David W.; Price, Frank C.; and Bosworth, George H., to USM Corporation. Seat and waist lasting machine-independently pivotable side lasting fingers. 4,296,513, Cl. 12-12.000.

Halliburton Company: *See—*
Hendrickson, James D.; and White, Pat M., 4,296,807, Cl. 166-184.000.
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., 4,297,575, Cl. 250-265.000.

Halliburton Services: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,296,808, Cl. 166-191.000.

Hamamto, Nobuo: *See—*
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.

Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Method of and apparatus for fabricating stator assemblies of electrical machines. 4,296,543, Cl. 29-596.000.

Hamar, Martin R. Apparatus and process for sweeping a flat optical light plane. 4,297,031, Cl. 356-247.000.

Hammann, Ingeborg: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.

Hammar, Jan E., to Forenade Fabriksverken. Method and apparatus for cleaning a continuous web of material. 4,296,767, Cl. 134-15.000.

Hammerstrom, Everett A. Tape measure and marking device. 4,296,554, Cl. 33-138.000.

Hanawa, Kazuhiko: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.

Hancor, Inc.: *See—*
Sidaway, H. John; and Good, Maynard, 4,296,891, Cl. 242-110.000.

Handa, Noritoshi, to Nissan Motor Company, Limited. Rubbing-contact sealing structure for rotary heat regenerator. 4,296,937, Cl. 277-88.000.

Handler, Michael D.: *See—*
Mason, Stanley I., Jr.; and Handler, Michael D., 4,296,746, Cl. 128-201.150.

Hannah, Stephen J.; and Livingstone, Bryan, to National Research Development Corporation. Surface passivation of compound semiconductors. 4,297,176, Cl. 204-37.00R.

Hannaht, David J., to University of Surrey, a part interest. Manufacture of articles from an organic material and a water-hardenable mass. 4,297,409, Cl. 428-247.000.

Hannestad, Gunnar: *See—*
Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.

Haraikawa, Tetsuo: *See—*
Tamura, Koichi; and Haraikawa, Tetsuo, 4,296,844, Cl. 188-73.380.

Harder, Willard J., to Bethany Fellowship, Inc. Solar energy collecting panel assembly. 4,296,741, Cl. 126-449.000.

Hardesty, Thomas K. C., to United States of America, Navy. Rotary locking mechanism. 4,296,689, Cl. 102-260.000.

Harding, Steven R.: *See—*
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.

Hardwick, Martha K.: *See—*
Buck, Gordon H.; and Hardwick, Martha K., 4,296,926, Cl. 273-86.00R.

Hargis, Ivan G.: *See—*
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.

Harima, Hiroshi: *See—*
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, 4,297,315, Cl. 264-322.000.

Harney, David L.; and Young, Harlow S., to Chef-Reddy Foods Corporation. Method of making French fryable frozen potato strips. 4,297,377, Cl. 426-438.000.

Harris Corporation: *See—*
Pan, Jing-Jong, 4,297,656, Cl. 331-135.000.

Harshman, Ronald W.; and Dietrich, Lynn A., to Walter Kidde & Company, Inc. Hydraulic selector valve having joy stick control. 4,296,773, Cl. 137-312.000.

Hart, Dale H., to Hi Shear Corporation. Telescoping self-retaining safety bolt assembly. 4,297,063, Cl. 411-199.000.

Hartley, Bobby G. Recycling centrifuge for the reduction of viscosity and gel strength of drilling fluids. 4,297,225, Cl. 210-779.000.

Hartwell, Charles A. Segmented hardfaced collar for tool joints. 4,296,973, Cl. 308-4.00A.

Hasegawa, Tsunao: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.

Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, to AGFA-Gevaert Aktiengesellschaft. Color-photographic development process. 4,297,438, Cl. 430-377.000.

Haseyama, Michiko: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.

Hashimoto, Kazuyuki: *See—*
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.

Hashimoto, Mitsuru: *See—*
Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, 4,297,426, Cl. 430-59.000.

Hashimoto, Sadakatsu, to Sharp Kabushiki Kaisha. Color uniforming drive in an electrochromic display device. 4,297,696, Cl. 340-785.000.

Hashimoto, Shunichi: *See—*
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.

Hashimoto, Tamotu: *See—*
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Hashimoto, Tutomu: *See—*
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Hashizume, Kiyozo: *See—*
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Hasselbarth, Ulrich: *See—*
Moll, Hans-Georg; Hasselbarth, Ulrich; Grohmann, Andreas; and Marks, Helmut, 4,297,221, Cl. 210-702.000.

Hastbacka, Albin A. Electro-optical level. 4,297,588, Cl. 250-577.000.

Haupt, Heinz: *See—*
Bohn, Hans; and Haupt, Heinz, 4,297,274, Cl. 260-112.00B.

Hauser, John. Fastening of shoe uppers for lasting. 4,296,515, Cl. 12-142.0LC.

Hauser, Raimund: *See—*
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Havlik, Patrick J. C.: *See—*
Monties, Jean R.; and Havlik, Patrick J. C., 4,296,500, Cl. 3-1.700.

Hayashi, Hideo: *See—*
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Hayashi, Izuo; and Yonezu, Hiroo, to Nippon Electric Co., Ltd. Injection-type semiconductor laser. 4,297,652, Cl. 331-94.50H.

Hayashi, Mitsuo: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.

Hayashi, Shigeyuki: *See—*
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Hayashi, Takayuki: *See—*
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, 4,297,235, Cl. 252-316.000.

Hayashi, Yoshihiro, to Aikoh Co., Ltd. Lance pipe for refining and method of making the same. 4,296,921, Cl. 266-270.000.

Hayes, Frederick: *See—*
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Health Innovations, Inc.: *See—*
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., 4,296,924, Cl. 272-117.000.

Heckelsberg, Robert E., to AMCA International Corporation. Roofing structure. 4,296,581, Cl. 52-520.000.

Heckmann, Klaus: *See—*
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Hedges, Rhey W., to Parker, Louis W. Energy economizer for induction motors. 4,297,628, Cl. 318-798.000.

Hehemann, Gunter. Stereo headset. 4,297,535, Cl. 179-156.00R.

Heilmann, Kurt: *See—*
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Heimbold, Richard L.: *See—*
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Heimburger, Norbert: *See—*
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Herchenhan, Bernd, 4,297,344, Cl. 424-101.000.

Hein, Lehmann AG: *See—*
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Heinrich Wunder KG: *See—*
Zoor, Reinhold, 4,296,615, Cl. 70-19.000.

Heiss, Herbert L., to Mobay Chemical Corporation. Method of producing color stable thermoplastic polymethanes and products made thereby. 4,297,472, Cl. 528-84.000.

Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., to Caterpillar Tractor Co. Engine and fuel shutdown control. 4,297,742, Cl. 361-154.000.

Helbig, Rolf W. Rack hanging device for garments. 4,296,959, Cl. 294-143.000.

Helger, Roland: *See—*
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Helwerth, Rainer: *See—*
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Hendricks, Udo-Winfried; and Wollny, Klaus, to Bayer Aktiengesellschaft. Process for the continuous one-bath dyeing of pile fabrics made of polyacrylonitrile/cotton. 4,297,103, Cl. 8-534.000.

Hendrickson, James D.; and White, Pat M., to Halliburton Company. Crossover tool. 4,296,807, Cl. 166-184.000.

Hennig, Ewald M. C.; and Nicol, Klaus. Method for determining the value of cardiologic quantities and apparatus for performing said method. 4,296,754, Cl. 128-694.000.

Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., to Zoecon Corp.; and Imperial Chemical Industries Limited. α-Cyano-β-(substituted-anilino)-N-ethoxycarbonylacrylamide intermediates. 4,297,297, Cl. 260-465.00D.

Henriques, Lance, to Angleman, John D. Rangefinder using expanded time delay. 4,297,701, Cl. 343-6.5LC.

Hensley, Albert L., Jr.; and Quick, Leonard M., to Standard Oil Company (Indiana). Process for demetallation and desulfurization of heavy hydrocarbons. 4,297,242, Cl. 252-439.000.

Herbert, Hugh G. Folding bicycle. 4,296,940, Cl. 280-278.000.

Herchenhan, Bernd: *See—*
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Hercules Incorporated: *See—*
Jolly, Jennings L.; and Roos, Leo, 4,297,435, Cl. 430-270.000.
Leardi, Anthony, 4,296,503, Cl. 4-228.000.

Herman, Seymour S., to Stan Herman Studio, Inc. Hospital patient gown. 4,296,497, Cl. 2-114.000.

Hermann Rappold & Co. GmbH: *See—*
Muller, Rudolf; Lengsfeld, Franz; and Uerlichs, Johannes, 4,296,776, Cl. 137-340.000.

Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, to Dynamit Nobel Aktiengesellschaft. Aromatic bisazomethines, a method for their preparation, and their use as reactive pigments. 4,297,502, Cl. 560-35.000.

Herrmann, Henry O., Jr., to AMP Incorporated. High voltage hermetically sealed connector. 4,296,986, Cl. 339-89.00C.

Herrmann, Walter: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.

Herzner, Karl H., to U.S. Philips Corporation. Apparatus for receiving storing and outputting digital signal sequences. 4,297,567, Cl. 235-92.0PB.

Heshmat, Hooshang, to Mechanical Technology Incorporated. Cross-plies support element for compliant bearings. 4,296,976, Cl. 308-9.000.

Heslep, Curtis A.: *See—*
Robertson, Kenneth L.; and Heslep, Curtis A., 4,296,708, Cl. 118-233.000.

Heurteux, Bernard M., to Shur-Lok International, S.A. Fastening device for a honeycombed panel employed in particular in aeronautic structures. 4,296,586, Cl. 52-787.000.

Hewitt, Harvey J., to Xerox Corporation. Overcoated photoreceptor containing gold injecting layer. 4,297,424, Cl. 430-58.000.

Heymes, Rene; and Lutz, Andre, to Roussel Uclaf. Novel oximes. 4,297,352, Cl. 424-246.000.

Hi Shear Corporation: *See—*
Hart, Dale H., 4,297,063, Cl. 411-199.000.

Hicke, David W., to Reagent Chemical and Research, Inc. Method of manufacturing cartridge cases. 4,296,536, Cl. 29-1.300.

Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, to Inkomag. Filtering apparatus. 4,297,211, Cl. 210-136.000.

Higashi, Akio; Kawaziri, Kazuhiro; and Nakajima, Yosuke, to Fuji Photo Film Co., Ltd. High frequency sputtering produces thin film amorphous silicon photoconductor. 4,297,392, Cl. 427-75.000.

Higuchi, Kosuke: *See—*
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, 4,297,553, Cl. 200-145.000.

Hijikata, Kazuo, to Olympus Optical Company Limited. Specimen applicator. 4,297,199, Cl. 204-299.00R.

Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, to Ajinomoto Company, Incorporated. Method for determining ammonia and sensor therefor. 4,297,173, Cl. 204-1.00T.

Hildebrandt, Norbert; Becker, Norbert; Walter, Rolf; and Hoffman, Manfred. Desk with a channel for receiving cables, wires etc. 4,296,981, Cl. 312-194.000.

Hill, Michael S.; and Poff, David A., to General Electric Company. Apparatus for assembling electrochemical cell. 4,296,546, Cl. 29-730.000.

Hinatase, Fumio: *See—*
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, 4,296,719, Cl. 123-198.00F.

Hines, David A.; and Bolton, David H., to Imperial Chemical Industries Limited. Treatment of wastewater. 4,297,217, Cl. 210-621.000.

Hinson, Virgil H.: *See—*
Jarman, Davis R.; and Hinson, Virgil H., 4,296,626, Cl. 72-392.000.

Hirabayashi, Shigeto: *See—*
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.

Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, to Shionogi & Co., Ltd. 4,1-Benzoxazepines. 4,297,280, Cl. 260-245.500.

Hirao, Tsuneo; and Onishi, Masao, to Matsushita Electric Industrial Co., Ltd. High-voltage generating device. 4,297,609, Cl. 310-339.000.

Hirayama, Kazuhiro; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Recording apparatus including a continuous transfer web. 4,297,716, Cl. 346-153.100.

Hirayama, Tatsuyuki: *See—*
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Hirmann, Georg: *See—*
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Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,775, Cl. 137-322.000.

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Taylor, Edward S.; and Hirschle, George W., 4,296,713, Cl. 122-32.000.

Hisabayashi, Satoshi: *See—*
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.

Hisaka Works, Ltd.: *See—*
Sumitomo, Hiroyuki, 4,296,803, Cl. 165-110.000.

Hitachi Chemical Co., Ltd.: *See—*
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, 4,297,471, Cl. 526-328.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.

Hitachi, Ltd.: *See—*
Furuhashi, Toshio; and Abe, Osamu, 4,296,722, Cl. 123-492.000.
Inouye, Hiroshi, 4,296,935, Cl. 277-81.00R.
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,297,216, Cl. 210-613.000.
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, 4,297,594, Cl. 307-252.00C.
Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,297,715, Cl. 346-150.000.
Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,297,601, Cl. 307-555.000.

Hitachi Metals, Ltd.: *See—*
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, 4,297,594, Cl. 307-252.00C.

Ho, Kok-Kit, to Timex Corporation. Clasp for watch strap. 4,296,532, Cl. 24-206.00R.

Hoda, Syed N.: *See—*
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.

Hodges, Everett L. Hydraulic mining tool apparatus. 4,296,970, Cl. 299-67.000.

Hoechst Aktiengesellschaft: *See—*
Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, 4,297,236, Cl. 252-389.00R.
Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, 4,297,323, Cl. 422-208.000.
Uhrig, Heinz; and Deubel, Reinhold, 4,297,270, Cl. 260-104.000.
von der Eltz, Hans-Ulrich; Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,297,101, Cl. 8-531.000.

Hoenninger, John C., III: *See—*
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,297,637, Cl. 324-309.000.

Hofbauer, Peter; Willmann, Michael; and Wundrak, Egon, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine for an automobile with a divided oil pan. 4,296,716, Cl. 123-195.00C.

Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, to Thyssen Aktiengesellschaft vormals August Thyssen-Hutte. Method for dividing a strand into slabs. 4,297,151, Cl. 148-9.00R.

Hoffman-La Roche Inc.: *See—*
Goldstein, Allan L.; and Low, Teresa L. K., 4,297,276, Cl. 260-112.50R.

Hoffman, Manfred: *See—*
Hildebrandt, Norbert; Becker, Norbert; Walter, Rolf; and Hoffman, Manfred, 4,296,981, Cl. 312-194.000.

Hoffman, Mark B.: *See—*
Baugh, Edward D.; and Hoffman, Mark B., 4,296,718, Cl. 123-198.00D.

Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, to Societe Nationale Industrielle Aerospatiale. Process and device for multiplying a stochastic value by a coefficient greater than the unit. 4,297,744, Cl. 364-703.000.

Hoffmann, Ralph M., to Trochoid Power Corporation. Rotary expansion power unit with valve disc connected to crankshaft. 4,297,090, Cl. 418-61.00A.

Hofmann, Heinrich; and Markfelder, Gunther, to Fag Kugelfischer Georg Schafer & Co. Journal bearing for the shaft of a water pump or the like. 4,296,979, Cl. 308-174.000.

Hofmann, Karl, to Robert Bosch GmbH. Heat protected fuel injection plug for internal combustion engines. 4,296,887, Cl. 239-397.500.

Hofstetter, Robert A. Energy saving pots, pans and adapter. 4,296,728, Cl. 126-376.000.

Holscher & Leuschner GmbH & Co.: *See—*
Holscher, Werner, 4,296,918, Cl. 256-68.000.

Holscher, Werner, to Holscher & Leuschner GmbH & Co. Animal pen post. 4,296,918, Cl. 256-68.000.

Holset Engineering Company Limited: *See—*
Atkin, Howard S., 4,296,934, Cl. 277-81.00R.

Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Industrie-Wert Beteiligungsgesellschaft mbH. Respiratory device for catastrophic fires and/or smog weather conditions. 4,297,117, Cl. 55-389.000.

Homeyer, Bernhard: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.
Honda, Hiroyuki; and Ura, Hiroaki, to Konishiroku Photo Industry Co., Ltd. Cleaning apparatus for copy machines. 4,297,026, Cl. 355-15.000.
Honeywell Inc.: *See—*
Butter, Charles D., 4,297,684, Cl. 340-557.000.
Honig, Ernst-August: *See—*
Oberpichler, Gerd; and Honig, Ernst-August, 4,296,652, Cl. 74-868.000.
Hooker Chemicals & Plastics Corp.: *See—*
Lazarz, Christine A.; and Cook, Edward H., Jr., 4,297,196, Cl. 204-296.000.
Horholt, Anders; and Kvist, Ulrik. Joining member. 4,296,524, Cl. 16-150.000.
Horman, Ian; and Cazenave, Paul, to Societe d'Assistance Technique pour Produits Nestle S.A. Tea flavoring process and product. 4,297,380, Cl. 426-597.000.
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, to H. Berthold Aktiengesellschaft. Additional attachment for all types of key operated machines. 4,297,044, Cl. 400-473.000.
Horowitz, Carl; and Dichter, Michael, to Polymer Research Corp. of America. Desulfurization of coal. 4,297,108, Cl. 44-1.0SR.
Horton, Herbert D.: *See—*
Keast, Larry G.; and Horton, Herbert D., 4,296,842, Cl. 188-61.000.
Horvath, Joseph. Profile grinding apparatus. 4,296,571, Cl. 51-32.000.
Hosaka, Dennis B., to Stauffer Chemical Company. Process for drying compositions containing derived protein-containing compositions and additives. 4,297,382, Cl. 426-656.000.
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, to Fuji Photo Film Co., Ltd. Method of preparing a microcapsule dispersion. 4,297,235, Cl. 252-316.000.
Hoshino, Kunihisa: *See—*
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.
Hotchkiss, Lloyd C.: *See—*
Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., 4,296,985, Cl. 339-48.000.
Housman, Richard J., to Westinghouse Air Brake Company. Housing for draft gear. 4,296,868, Cl. 213-50.000.
Hoval Interliz AG: *See—*
Vogt, Alfred, 4,296,712, Cl. 122-22.000.
Howarth, Thomas T., to Beecham Group Limited. Antibacterial agents. 4,297,345, Cl. 424-114.000.
Howell, Edward K., to General Electric Company. Rate sensing instantaneous trip mode network. 4,297,741, Cl. 361-93.000.
Howell, Stephen L., to Kimball International, Inc. Fill note generator for electronic organ. 4,296,665, Cl. 84-1.030.
Hoyer, Ernst H. J. Ball valve. 4,296,913, Cl. 251-76.000.
Hsu, Fu-Tong; and Kantz, John F., to Union Carbide Corporation. Bulk material box. 4,296,860, Cl. 206-386.000.
Hsu, Sheng T., to RCA Corporation. Electrically programmable control gate injected floating gate solid state memory transistor and method of making same. 4,297,719, Cl. 357-23.000.
Huck, William V., to Minnesota Mining and Manufacturing Company. Protective band for photosensitive film on spools. 4,296,857, Cl. 206-53.000.
Hudson Products Corporation: *See—*
Larinoff, Michael W., 4,296,802, Cl. 165-110.000.
Huellwegen, Josef, to Nixdorf Computer AG. Signal regenerating circuit with improved input-output isolation. 4,297,595, Cl. 307-268.000.
Hughes Aircraft Company: *See—*
Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., 4,297,704, Cl. 343-113.00R.
Wurtz, Howard P.; and Peterson, Eugene W., 4,297,082, Cl. 417-51.000.
Hughes, Donald W. K.; and Myers, Ronald W., to AMP Incorporated. Electrical connector receptacle. 4,296,991, Cl. 339-176.0MP.
Hughes, Eugene M., to British Petroleum Company Limited, The. Anchor. 4,296,706, Cl. 114-294.000.
Hughes Tool Company: *See—*
Griste, Charles R., 4,296,819, Cl. 173-147.000.
Kennington, Kerry S., 4,296,824, Cl. 175-340.000.
Hull, Michael N.: *See—*
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., 4,297,421, Cl. 429-225.000.
Hundere, Ingleif: *See—*
Gjelsvik, Norvald; and Hundere, Ingleif, 4,297,326, Cl. 423-126.000.
Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.
Hunt, Keith R.; and Fisher, Sidney E., to Britax Weathershields Limited. Opening roofs for vehicles. 4,296,961, Cl. 296-216.000.
Hunter, Walter D., to Texaco Development Corp. Process for secondary recovery. 4,297,226, Cl. 252-8.55D.
Hunter, Walter D., to Texaco Development Corp. Bipolymer of vinyl sulfonic acid-glycidol adduct and acrylamide. 4,297,469, Cl. 526-287.000.
Hussmann, Eckart, to JENAer Glaswerk Schott & Gen. Flat solar energy collector with low heat contact between absorber and edge of collector. 4,296,742, Cl. 126-450.000.
Hutchings, Clay L.: *See—*
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L., and Miller, Robert G., 4,297,742, Cl. 361-154.000.
Hutchins, Alma A., to Hutchins Manufacturing Co. Vacuum cleaner having bag cleaning apparatus. 4,297,114, Cl. 55-299.000.
Hutchins Manufacturing Co.: *See—*
Hutchins, Alma A., 4,297,114, Cl. 55-299.000.
Hutchins, Ned M.: *See—*
Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., 4,296,968, Cl. 299-2.000.
Hutchison, Joseph A., to Solar Kinetics, Inc. Solar collector module. 4,297,003, Cl. 350-292.000.
Hydell, Robert C.: *See—*
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,295,947, Cl. 282-27.500.
Ibsen, Robert L.; and Glace, William R., to Den-Mat, Inc. Microfilled dental composite and method using the same. 4,297,266, Cl. 260-42.140.
Ichikawa, Hideji: *See—*
Nishiyama, Yukinori; and Ichikawa, Hideji, 4,296,843, Cl. 188-73.430.
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, to Canon Kabushiki Kaisha. Laser recording apparatus. 4,297,713, Cl. 346-108.000.
Ichimatsu, Eiji, to Nissan Motor Company, Ltd. Weft yarn end treating device for shuttleless loom. 4,296,783, Cl. 139-302.000.
Ichino, Kazuo: *See—*
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.
ICI Americas Inc.: *See—*
Long, William P., Jr., 4,297,258, Cl. 260-29.6MN.
Stockburger, George J., 4,297,290, Cl. 260-410.600.
Ieki, Hideharu; and Arai, Seiichi, to Murata Manufacturing Co., Ltd. Electric circuit using surface acoustic wave device. 4,297,660, Cl. 333-194.000.
Igelbuscher, Heinrich: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,297,117, Cl. 55-389.000.
Iguchi, Eiko: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Iguchi, Shin-Ichi: *See—*
Nishizawa, Hideaki; and Iguchi, Shin-Ichi, 4,297,720, Cl. 357-30.000.
Iizuka, Haruhiko; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Internal combustion engine. 4,296,724, Cl. 123-568.000.
Ikai, Shigeru: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Ikeya, Chuji: *See—*
Shimizu, Ken-Ichi; and Ikeya, Chuji, 4,297,725, Cl. 358-125.000.
Illinois Tool Works Inc.: *See—*
Edwards, Bryant, 4,296,569, Cl. 47-73.000.
Ernst, Richard J., 4,296,656, Cl. 81-429.000.
Platt, John R., 4,296,858, Cl. 206-150.000.
Imai, Nobuhiro: *See—*
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.
Imamura, Shinzo: *See—*
Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, 4,297,477, Cl. 528-323.000.
Imanaka, Hiroshi: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Imperial Chemical Industries Limited: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.
Hines, David A.; and Bolton, David H., 4,297,217, Cl. 210-621.000.
Marsden, Robert S., 4,297,336, Cl. 423-395.000.
Stead, John C.; and Waghorn, Peter E., 4,297,408, Cl. 428-240.000.
IMS Limited: *See—*
Ogle, Robert W., 4,296,747, Cl. 128-220.000.
Inayama, Minoru; and Furukawa, Yukio, to Rinnai Kabushiki Kaisha. Composite cooking device. 4,297,558, Cl. 219-10.55R.
Industrie-Wert Beteiligungsgesellschaft mbH: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,297,117, Cl. 55-389.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Becchi, Raffaele; Giacone, Felice; and Accattino, Andrea, 4,297,573, Cl. 250-231.0SE.
Inhofer, Harold G., to Proteus Corporation Reciprocating piston-cylinder combination and valving control therefor. 4,296,672, Cl. 91-271.000.
Inkomag: *See—*
Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, 4,297,211, Cl. 210-136.000.
Innocenti Santeustacchio S.p.A.: *See—*
Nessi, Aurindo, 4,296,622, Cl. 72-208.000.
Inomata, Akira: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.
Inoue, Shigeo: *See—*
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, 4,297,340, Cl. 424-70.000.

Inoue, Tokuji: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Inoue, Yoshimi: *See*—
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, 4,297,263, Cl. 260-32.6PQ.
Inouye, Hiroshi, to Hitachi, Ltd. Mechanical seal. 4,296,935, Cl. 277-81.00R.
Institut Dr. Friedrich Forster Prufgeratebau: *See*—
Link, Hans; and Dreher, Ulrich, 4,297,636, Cl. 324-262.000.
Institut Francais du Petrole: *See*—
Layotte, Pierre-Claude; and James, Andre, 4,296,828, Cl. 181-121.000.
Institut National de la Sante et de la Recherche Medicale: *See*—
Rips, Richard; and Morier, Elisabeth, 4,297,346, Cl. 424-177.000.
Intec Corporation: *See*—
Baker, Cole H., 4,297,587, Cl. 250-563.000.
International Business Machines Corporation: *See*—
Abdelfotoh, Mohamed O., 4,297,613, Cl. 315-58.000.
Andresen, Rolf; and Christian, John H., 4,297,737, Cl. 360-135.000.
Aviram, Ari, 4,297,434, Cl. 430-270.000.
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.
Bjorklund, Gary C., 4,297,035, Cl. 356-402.000.
Burton, Robert L.; and Finan, Thomas P., 4,297,045, Cl. 400-641.000.
Laishley, William J.; and Taylor, John R., 4,297,734, Cl. 360-78.000.
Lammers, Gerald B.; and Smith, Gordon J., 4,297,712, Cl. 346-75.000.
Schaefer, John O., 4,297,041, Cl. 400-161.400.
International Minerals & chemical Corporation: *See*—
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., 4,297,443, Cl. 521-129.000.
International Nickel Company, Inc., The: *See*—
Crosby, Jeffrey N., 4,297,178, Cl. 204-47.000.
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,297,136, Cl. 75-206.000.
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., 4,297,421, Cl. 429-225.000.
International Telephone and Telegraph Corporation: *See*—
Bickel, Gary W., 4,296,995, Cl. 350-96.150.
Salman, Syed, 4,297,197, Cl. 204-297.00W.
Interscan Corporation: *See*—
Shaw, Manuel; and Thatcher, Imbrie, 4,297,689, Cl. 340-632.000.
Interstate Electronics Corp.: *See*—
Beno, Richard D., 4,297,528, Cl. 179-1.0SB.
Irvin, William A. Liquid level control system. 4,297,081, Cl. 417-2.000.
Isaka, Tsutomu: *See*—
Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, 4,297,310, Cl. 264-83.000.
Isayama, Shogo: *See*—
Takehara, Nobumitsu; and Isayama, Shogo, 4,297,396, Cl. 427-284.000.
Isenberg, Jack M., to Boeing Company, The. Apparatus and method for manufacturing laminar flow control aircraft structure. 4,296,899, Cl. 244-207.000.
Ishiba, Teruyuki: *See*—
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,297,280, Cl. 260-245.500.
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, to Hitachi, Ltd. Apparatus for removing nitrogen oxides from flue gas. 4,297,319, Cl. 422-114.000.
Ishida, Atsuo: *See*—
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, 4,297,340, Cl. 424-7[illegible].000.
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, to Hitachi, Ltd. Method for treatment of biochemical waste. 4,297,216, Cl. 210-613.000.
Ishida, Takashi; and Tanaka, Mamoru, to Nissan Motor Company, Limited. Support assembly for an exhaust system of a motor vehicle. 4,296,907, Cl. 248-573.000.
Ishihara, Michio: *See*—
Nagahama, Tsutomu; and Ishihara, Michio, 4,297,722, Cl. 357-74.000.
Ishii, Masaaki: *See*—
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.
Ishii, Satoshi: *See*—
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.
Ishii, Sizuo: *See*—
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.
Ishikawa, Masakazu: *See*—
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Ishioka, Mitsugu: *See*—
Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, 4,297,310, Cl. 264-83.000.
Isobe, Mitsuhide, to Shimano Industrial Company, Limited. Rear hub having improved mounting of a cylindrical bearing member to an inner member. 4,296,850, Cl. 192-64.000.
Ito, Fumio: *See*—
Murakami, Hiroyashu; Ito, Tadashi; and Ito, Fumio, 4,297,018, Cl. 354-50.000.
Ito, Isao; and Tunashima, Seiichi, to NGK Insulators, Ltd. Apparatus for measuring contour configuration of articles. 4,297,034, Cl. 356-394.000.
Ito, Kunimoto; Kakizawa, Tsutomu; Yonetani, Kengo; and Nariai, Hiroshi. Small piezoelectric tuning fork. 4,297,610, Cl. 310-370.000.
Ito, Tadashi: *See*—
Murakami, Hiroyashu; Ito, Tadashi; and Ito, Fumio, 4,297,018, Cl. 354-50.000.
Ito, Takaharu: *See*—
Yasuba, Shoichi; and Ito, Takaharu, 4,296,657, Cl. 82-1.00C.
Ito, Takashi: *See*—
Kamogawa, Nin-ichi; and Ito, Takashi, 4,297,562, Cl. 219-216.000.
Ito, Thomas I.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., 4,297,510, Cl. 564-13.000.
Iwai, Michinobu; and Tanimoto, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Movable contact arm assembly. 4,297,555, Cl. 200-153.00G.
Iwamoto, Masaru. Speed up device for bicycle. 4,296,939, Cl. 280-212.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Automatic power transmission shift valve. 4,296,651, Cl. 74-869.000.
Iwasa, Masakazu: *See*—
Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, 4,297,384, Cl. 427-14.100.
Iwatsu Electric Co., Ltd.: *See*—
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.
Izod, Thomas J. P.: *See*—
Lok, Brent M. T.; and Izod, Thomas J. P., 4,297,335, Cl. 423-328.000.
J. I. Case Company: *See*—
Benson, Samuel L., 4,296,846, Cl. 192-4.00A.
Jachimowicz, Felek, to W. R. Grace & Co. Process of forming polymeric polyamine/amide. 4,297,481, Cl. 528-392.000.
Jackel, Klaus: *See*—
Werner, Peter; Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, 4,297,599, Cl. 307-355.000.
Jacobs Manufacturing Company, The: *See*—
Price, Robert B., 4,296,605, Cl. 60-599.000.
Jacobs, Marcellus L.; and Jacobs, Paul R. Automatic storm protection control for wind energy system. 4,297,075, Cl. 416-14.000.
Jacobs, Paul R.: *See*—
Jacobs, Marcellus L.; and Jacobs, Paul R., 4,297,075, Cl. 416-14.000.
Jaeggi, Knut A.: *See*—
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.
Jaffe, Max: *See*—
Concha, Edward; Jaffe, Max; and Bedford, Riley, 4,297,068, Cl. 414-458.000.
Jaffin, Harry A.; and Gliewe, Russell H. Apparatus for collecting ejected cartridges. 4,296,565, Cl. 42-1.00T.
James, Andre: *See*—
Layotte, Pierre-Claude; and James, Andre, 4,296,828, Cl. 181-121.000.
James, Kenneth A.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,296,994, Cl. 350-3.730.
Jameson, James J., to Cooper Industries, Inc. Powershift transmission with direct drive and modulated torque converter drive in forward and reverse. 4,296,645, Cl. 74-688.000.
Janson, Mats O., to Tylo Sauna S.A. Sauna heating unit and shield therefor. 4,296,507, Cl. 4-524.000.
Jardin, Hans; and Hirschberger, August, to Webasto-Werk W. Baier GmbH & Co. Wind deflector for sliding roofs of motor vehicles. 4,296,962, Cl. 296-217.000.
Jarman, Davis R.; and Hinson, Virgil H. Wheel alignment apparatus. 4,296,626, Cl. 72-392.000.
Jarnum, Lennart, to AB Jarnkonstruktioner. Vertically adjustable bridge for connection with ships. 4,296,516, Cl. 14-71.700.
Jarrett, Robert B.: *See*—
LoCascio, James J.; and Jarrett, Robert B., 4,297,646, Cl. 330-288.000.
Jawad, Maan, to Nooter Corporation. Pressure vessel head. 4,296,869, Cl. 220-3.000.
Jehle, Fritz; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Device for the automatic guiding of a workpiece on a sewing machine. 4,296,700, Cl. 112-153.000.
JENAer Glaswerk Schott & Gen.: *See*—
Hussmann, Eckart, 4,296,742, Cl. 126-450.000.
Ritze, Willy, 4,297,142, Cl. 501-77.000.
Jensen, Borge R., to Danfoss A/S. Measuring equipment for acoustic determination of the specific gravity of liquids. 4,297,608, Cl. 310-335.000.
Jensen, Michael E.: *See*—
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L., 4,297,120, Cl. 65-281.000.
Jervis, James E., to Raychem Corporation. Heat-shrinkable hollow article. 4,297,155, Cl. 156-86.000.
Jesse, Harold W.; and Jones, Peter M., to TME, Inc. Cable shield. 4,297,522, Cl. 174-36.000.
Jewett, M. Pearson. Submersible pump puller. 4,296,916, Cl. 254-380.000.

Jidosha Kiki Co., Ltd.: *See*—
Ohta, Ryuji; and Kobayashi, Michio, 4,296,680, Cl. 92-98.00D.
Jikihara, Tomo: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.
John C. Lehman, Inc.: *See*—
Lehman, John C., 4,296,984, Cl. 312-268.000.
John Fluke Mfg. Co., Inc.: *See*—
Koeman, Henriecus, 4,297,680, Cl. 340-347.0AD.
John Zink Company: *See*—
Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., 4,297,094, Cl. 431-202.000.
Johnson, Allen S., Jr., to Staclean Diffuser Company. Bag-type filter with air diffuser tubes of helical construction. 4,297,115, Cl. 55-302.000.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Scanning shutter blade arrangement with dynamic apertures for ambient and flash exposures. 4,297,016, Cl. 354-27.000.
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., to Bell Telephone Laboratories, Incorporated. Persistent memory cell. 4,297,005, Cl. 350-357.000.
Johnson & Johnson: *See*—
Nguyen, Hien V., 4,297,404, Cl. 428-85.000.
Welsh, Luther; Bergquist, Daryl J.; and Watanabe, Hideo, 4,296,752, Cl. 128-635.000.
Johnson, Matthey & Co., Limited: *See*—
Sermon, Paul A., 4,297,331, Cl. 423-239.000.
Johnson, Paul H., to Phillips Petroleum Company. Waste heat recovery. 4,296,800, Cl. 165-95.000.
Johnson, Steven A. Focusing cover solar energy collector apparatus. 4,297,521, Cl. 136-248.000.
Jolly, Jennings L.; and Roos, Leo, to Hercules Incorporated. Contrast colorant for photopolymerizable compositions. 4,297,435, Cl. 430-270.000.
Jones, John B.; and Kunchal, S. Kumar. Process for oil shale retorting. 4,297,201, Cl. 208-11.00R.
Jones, Peter M.: *See*—
Jesse, Harold W.; and Jones, Peter M., 4,297,522, Cl. 174-36.000.
Joppien, Harmut: *See*—
Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Harmut, 4,297,361, Cl. 424-263.000.
Jordening, Harold G. Bike carrying adapter. 4,296,879, Cl. 224-42.45R.
Jordon, Hans: *See*—
Bohler, Joachim; and Jordon, Hans, 4,296,517, Cl. 15-93.00R.
Joslin, Joel A.; and Ranford, Alan B., to Sherwood Medical Industries Inc. Blood collection device and method with anti-backflow means. 4,296,759, Cl. 128-766.000.
Jouffret, Michel: *See*—
Costantini, Michel; and Jouffret, Michel, 4,297,287, Cl. 260-348.160.
Jozwiak, Edward L., Jr., to PPG Industries, Inc. Cationic polymers and their use in electrodeposition. 4,297,261, Cl. 260-29.7RP.
Jubilee Manufacturing Co.: *See*—
Merten, Richard C., 4,297,674, Cl. 340-63.000.
Jude Engineering, Inc.: *See*—
Christian, Robert F., 4,297,208, Cl. 210-94.000.
Judell, Neil H. K., to Datamedix Inc. Method and apparatus for determining ventricular fibrillation. 4,296,755, Cl. 128-705.000.
Juner, Adolph; and Haas, David J., to North American Philips Corporation. X-ray optical system for article inspection, with components disposed on parallel axes. 4,297,580, Cl. 250-368.000.
Jung, Wilhelm; and Rau, Karl, to VDO Adolf Schindling AG. Apparatus for capacitive filling-level measuring, particularly in a motor vehicle tank. 4,296,630, Cl. 73-304.00C.
Jureit, John C.; and Greenley, Henry R., to Automated Building Components, Inc. Fasteners for joining angularly related wooden members. 4,297,048, Cl. 403-189.000.
Jyojiki, Masao: *See*—
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,297,014, Cl. 354-25.000.
Kabas, Guglielmo: *See*—
Burdeska, Kurt; and Kabas, Guglielmo, 4,297,234, Cl. 252-301.240.
Kabel-und Metallwerke Gutehoffnungshuette A.G.: *See*—
Leuchs, Ottmar; and Maltz, Georg, 4,297,526, Cl. 174-102.00R.
Kabushiki Kaisha Fujikoshi: *See*—
Okano, Hiroshi; and Sato, Akira, 4,296,648, Cl. 74-798.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Mitsui, Yoshihiro, 4,297,697, Cl. 340-813.000.
Kabushiki Kaisha Taiyohatsujyo Seisakusho: *See*—
Nagano, Kenji, 4,296,534, Cl. 24-270.000.
Kabushikikaisha Asahi Shinbunsha: *See*—
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, 4,297,263, Cl. 260-32.6PQ.
Kadokura, Koichi: *See*—
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, to Pioneer Electronic Corporation. Magnetic recording and reproducing device. 4,297,730, Cl. 360-66.000.
Kagata, Tooru; and Goto, Hiromi, to Aisin Seiki Kabushiki Kaisha. Free wheel hub mechanism. 4,296,848, Cl. 192-35.000.
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, to Bachofen AG. Device for detachably coupling the orifice of a branchline to a line carrying a pressure medium. 4,296,774, Cl. 137-322.000.
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, to Bachofen, AG. Device for detachably coupling a branchline to a pressure line. 4,296,775, Cl. 137-322.000.
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Process for producing a positive electrode for a non-aqueous electrolytic cell. 4,297,231, Cl. 252-182.100.
Kai, Yoshiyuki: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Kajavo, Kari: *See*—
Lampinen, Esko; and Kajavo, Kari, 4,296,545, Cl. 29-602.00R.
Kakigi, Takao, to Cybernet Electronics Corp. Photoelectric smoke sensing and alarming device. 4,297,688, Cl. 340-630.000.
Kakimi, Fujio: *See*—
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, 4,297,235, Cl. 252-316.000.
Kakizawa, Tsutomu: *See*—
Ito, Kunimoto; Kakizawa, Tsutomu; Yonetani, Kengo; and Nariai, Hiroshi, 4,297,610, Cl. 310-370.000.
Kalfoglou, George, to Texaco Inc. Surfacant waterflooding oil recovery method. 4,296,812, Cl. 166-274.000.
Kali and Salz AG: *See*—
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.
Kalns, Ilmars, to Eaton Corporation. Two-speed transaxle. 4,296,650, Cl. 74-751.000.
Kamada, Masataka; and Satoh, Seiji. Decorated soap and method for producing the same. 4,297,228, Cl. 252-92.000.
Kamar International, Inc.: *See*—
Kamar, Pascal M., 4,296,567, Cl. 46-163.000.
Kamar, Pascal M., to Kamar International, Inc. Figure toy with flexible appendages. 4,296,567, Cl. 46-163.000.
Kambanis, Stamatis M.: *See*—
De Ruiter, Robert S.; and Kambanis, Stamatis M., 4,297,264, Cl. 260-33.40R.
Kamibayashi, Tetsusaburo: *See*—
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,297,602, Cl. 310-26.000.
Kaminishi, Katuzo: *See*—
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, 4,297,647, Cl. 330-307.000.
Kamogawa, Nin-ichi; and Ito, Takashi, to Konishiroku Photo Industry Co., Ltd. Heat roller type fixing apparatus. 4,297,562, Cl. 219-216.000.
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Photographic material and diffusion transfer processing solution for making printing plates and method for making printing plates. 4,297,429, Cl. 430-204.000.
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Photographic material for production of printing plates and method for production of printing plates. 4,297,430, Cl. 430-204.000.
Kanegae, Hidetoshi: *See*—
Abo, Toshimi; and Kanegae, Hidetoshi, 4,296,600, Cl. 60-39.28R.
Kaneko, Tomonobu, to Amada Company, Limited. Feed control for horizontal bandsaw machines. 4,296,661, Cl. 83-796.000.
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, to Konishiroku Photo Industry Co., Ltd. Processing method of silver halide color photographic material. 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, to Konishiroku Photo Industry Co., Ltd. Photographic material. 4,297,441, Cl. 430-543.000.
Kangol Magnet Limited: *See*—
Clifford, Roy, 4,296,942, Cl. 280-803.000.
Kansas State University Research Foundation: *See*—
Kyle, Benjamin G., 4,297,172, Cl. 203-19.000.
Kantz, John F.: *See*—
Hsu, Fu-Tong; and Kantz, John F., 4,296,860, Cl. 206-386.000.
Kao Soap Co., Ltd.: *See*—
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, 4,297,340, Cl. 424-70.000.
Tsuchiya, Yoshimi; Sagae, Masayuki; and Mizutani, Hiroshi, 4,297,410, Cl. 428-283.000.
Kaplan, Murray A.: *See*—
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,297,489, Cl. 544-27.000.
Kara, Frederick E.: *See*—
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.
Karady, Sandor: *See*—
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,297,488, Cl. 544-21.000.
Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., to Bendix Corporation, The. Integral electrical contact and method of making same. 4,296,985, Cl. 339-48.000.
Karube, Isao: *See*—
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.
Kasahara, Nobuyoshi; and Nonomura, Koutaro, to Mitsui Mining & Smelting Co., Ltd. Corrosion resistant metallic article having a matt nacreous appearance. 4,297,405, Cl. 428-141.000.
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, to Kuraray Company, Ltd. Method of making wig archetype. 4,297,315, Cl. 264-322.000.

Kashiwabara, Akira: *See*—
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, 4,297,436, Cl. 430-310.000.
Kato, Hisashi: *See*—
Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, 4,297,384, Cl. 427-14.100.
Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, to Nihon Medi-Physics, Co., Ltd. Thallium-carrying target material and its production. 4,297,166, Cl. 376-194.000.
Kato, Shiro: *See*—
Tsuboi, Akira; and Kato, Shiro, 4,296,541, Cl. 29-568.000.
Katoh, Haruhiko: *See*—
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.
Katsube, Junki: *See*—
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, 4,297,282, Cl. 260-326.200.
Katsunuma, Nobuhiko. Nucleoside derivatives and an antileukemial agent containing the same as an active ingredient. 4,297,347, Cl. 424-180.000.
Katsuragi, Shigeru: *See*—
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.
Katzman, Allison W.: *See*—
Erickson, Erick E.: Katzman, Allison W.; and Breslow, Jeffrey D., 4,297,153, Cl. 156-63.000.
Kaufel Group Ltd.: *See*—
Chandler, Edward A., 4,297,614, Cl. 315-86.000.
Kaufman, Jack W.: *See*—
Blake, Joseph W., III; and Kaufman, Jack W., 4,296,751, Cl. 128-325.000.
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., to Union Carbide Corporation. Method of preparing an olefin hydration catalyst. 4,297,241, Cl. 252-435.000.
Kavchok, Ronald W.: *See*—
Papalos, John G.; and Kavchok, Ronald W., 4,297,259, Cl. 260-29.6NR.
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Enclosed switching apparatus. 4,297,553, Cl. 200-145.000.
Kawakami, Tomiko: *See*—
Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, 4,297,426, Cl. 430-59.000.
Kawakami, Yasushi: *See*—
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, 4,297,647, Cl. 330-307.000.
Kawakatsu, Satoshi: *See*—
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.
Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Coordinating control system for camera. 4,297,013, Cl. 354-23.00D.
Kawaziri, Kazuhiro: *See*—
Higashi, Akio; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,297,392, Cl. 427-75.000.
KBI Corp., The: *See*—
Kirk, Joseph R.; and Campbell, Edward C., 4,297,219, Cl. 210-669.000.
Keast, Larry G.; and Horton, Herbert D., to World Wide Oil Tools, Inc. Pawl and ratchet mechanism. 4,296,842, Cl. 188-61.000.
Keckman, Heikki. Skylight apparatus. 4,296,578, Cl. 52-200.000.
Kekalo, Vasily I.: *See*—
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.
Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Controlling overheating of vacuum mold used to shape glass sheets. 4,297,118, Cl. 65-104.000.
Keller, Robert N., to National Steel Corporation. Method of manufacturing expanded reinforcing sheet material. 4,297,154, Cl. 156-79.000.
Kelman, Charles D. Intraocular lens and method of making the same. 4,296,501, Cl. 3-13.000.
Kelsey, Wayne R.: *See*—
Muetterties, Andrew J.; Vcelka, John L.; and Kelsey, Wayne R., 4,296,949, Cl. 285-18.000.
Kelton, Wallace G. Cylindrical solar energy collector. 4,296,738, Cl. 126-443.000.
Kemi-Intressen AB: *See*—
Lundgren, Sune I.; and Rehnberg, Leif E. L., 4,296,653, Cl. 81-3.46R.
Kemper, Yves J., to Vadetec Corporation. Differential transmission drive unit. 4,296,647, Cl. 74-690.000.
Kempf, Georg: *See*—
Schlauer, Johann; Kempf, Georg; and Doerges, Alexander, 4,297,330, Cl. 423-232.000.
Ken-Koat, Inc.: *See*—
Robertson, Kenneth L.; and Heslep, Curtis A., 4,296,708, Cl. 118-233.000.
Kennametal Inc.: *See*—
Armbrust, William D.; and McCreery, James F., 4,297,058, Cl. 407-113.000.
Kennedy, Leroy P., to Abex Corporation. Railroad car hand brake signal device. 4,296,707, Cl. 116-58.00A.
Kenneth E. Beswick Ltd.: *See*—
Gale, James A., 4,297,669, Cl. 337-407.000.
Kennington, Kerry S., to Hughes Tool Company. Nozzle placement in large diameter earth boring bits. 4,296,824, Cl. 175-340.000.
Kenyon, Ralph E.: *See*—
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.
Keplinger, Klaus: *See*—
Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, 4,297,211, Cl. 210-136.000.
Kern, Jorg; and Guth, Christian, to Ciba-Geigy Corporation. Process for imparting to textile materials a soft handle using unsaturated aliphatic acid amides. 4,297,400, Cl. 427-389.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Arbel, Arie; and Kurz, Rainer, 4,297,679, Cl. 340-347.0AD.
Kernforschungszentrum Karlsruhe, GmbH: *See*—
Scheffler, Knut; and Riege, Ulrich, 4,297,304, Cl. 264-0.500.
Kessler, Bayard F., to Novation, Inc. Electronics package. 4,297,530, Cl. 179-2.00C.
Kester, Jack R.: *See*—
Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., 4,297,561, Cl. 219-137.630.
Kezerian, Charles: *See*—
Gaughan, Edmund J.; and Kezerian, Charles, 4,297,295, Cl. 260-455.00A.
Kicinski, Kenneth J., to Nelson Industries, Inc. Exhaust muffler. 4,296,832, Cl. 181-255.000.
Kiekhaefer, Elmer C. Stern drive mechanism. 4,297,097, Cl. 440-59.000.
Kieserling & Albrecht: *See*—
Weller, Alois; and Mai, Wolfgang, 4,296,625, Cl. 72-345.000.
Kihira, Masafumi: *See*—
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,296,543, Cl. 29-596.000.
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., to Rohm and Haas Company. 3-Pyridylmethylthiocarbamates. 4,297,342, Cl. 424-84.000.
Kilinskas, William A.; Selines, Ronald J.; and Vand den Sype, Jaak S., to Union Carbide Corporation. Method for making fasteners. 4,296,512, Cl. 10-27.00E.
Killer, Walter HP. Method and apparatus for reducing the activation energy of chemical reactions. 4,297,186, Cl. 204-165.000.
Kimball International, Inc.: *See*—
Howell, Stephen L., 4,296,665, Cl. 84-1.030.
Wilcox, Brian N.; and Robinson, John W., 4,296,666, Cl. 84-1.260.
Kimberly-Clark Corporation: *See*—
Woon, Lin-Sun; and Wilson, John C., 4,296,750, Cl. 128-287.000.
Kimura, Kiyoshi: *See*—
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.
Kimura, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Darlington-connected semiconductor device. 4,297,597, Cl. 307-315.000.
Kinbara, Koichi; Sugimoto, Norimaro; and Nakazawa, Toshitaka, to Meito Co. Ltd.; and Toyo Pulp Co. Ltd. Packaging bag. 4,297,402, Cl. 428-35.000.
Kinoshita, Toshio: *See*—
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Kinugawa, Ryoji: *See*—
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Kirchmayr, Rudolf: *See*—
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Kirimura, Shunichiro: *See*—
Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, 4,297,187, Cl. 204-165.000.
Kirk, Joseph R.; and Campbell, Edward C., to KBI Corp., The. Temporary stream filtration system. 4,297,219, Cl. 210-669.000.
Kita, Toshio: *See*—
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Kitahara, Tohru: *See*—
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.
Kitajima, Yoshiro: *See*—
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, 4,297,553, Cl. 200-145.000.
Kiteley, Terence J., to Zenith Radio Corporation. Phosphor protection circuit for multiple CRT projection television. 4,297,619, Cl. 315-381.000.
Kitsuregawa, Takashi: *See*—
Nishizawa, Jun-Ichi; and Kitsuregawa, Takashi, 4,297,718, Cl. 357-22.000.
Kizaki, Jiro; and Fujii, Takashi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Tandem master cylinder. 4,296,604, Cl. 60-562.000.
Klaeui, Heinrich: *See*—
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,296,801, Cl. 165-104.170.
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., to CPC International Inc. High speed corrugating adhesives. 4,297,144, Cl. 106-197.00C.
Kleine-Kleffmann, Werner: *See*—
Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.

Kleinschmit, Peter; and Schwarz, Rudolf, to Degussa Aktiengesellschaft. Temperature stabilized silicon dioxide-mixed oxide, the process for its production and use. 4,297,143, Cl. 501-103.000.
KMS Fusion, Inc.: *See*—
Breuckner, Keith A., 4,297,165, Cl. 376-103.000.
Knappe, Rudolf: *See*—
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.
Knepp, Gary L.: *See*—
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., 4,297,742, Cl. 361-154.000.
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Stephens, William I., 4,296,574, Cl. 52-27.000.
Kobayashi, Hideo: *See*—
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.
Kobayashi, Itaru. Guitarist's foot-rest. 4,296,694, Cl. 108-116.000.
Kobayashi, Michio: *See*—
Ohta, Ryuji; and Kobayashi, Michio, 4,296,680, Cl. 92-98.00D.
Kobayashi, Susumu, to Terumo Corporation. Centrifugal fluid processing device. 4,296,882, Cl. 233-21.000.
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, to Kokusai Denshin Denwa Kabushiki Kaisha. Magnetostrictive co-ordinate plate for co-ordinate reader. 4,297,602, Cl. 310-26.000.
Kobe Steel, Limited: *See*—
Asami, Takayoshi, 4,296,539, Cl. 29-157.30A.
Morimoto, Kotaro; and Suzuki, Tomio, 4,297,093, Cl. 431-10.000.
Kobler, Robert J., to AMP Incorporated. Method of manufacturing electrical connector receptacle. 4,296,550, Cl. 29-884.000.
Kobylinski, Thaddeus P.: *See*—
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,297,518, Cl. 568-385.000.
Koch, Arnold K.: *See*—
Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, 4,297,305, Cl. 264-0.500.
Koch, Claude V., to AMF Incorporated. Actuating means for switch operation in timing apparatus. 4,297,546, Cl. 200-38.00R.
Koci, Zdenek; and Mollet, Hans, to Ciba-Geigy Corporation. Aqueous dye preparations. 4,297,100, Cl. 8-527.000.
Kodama, Akira: *See*—
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Figure displaying device. 4,297,691, Cl. 340-723.000.
Koegel, Wolfram: *See*—
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.
Koehler, Robert P. Slide tray protector. 4,297,010, Cl. 353-122.000.
Koeman, Henriecus, to John Fluke Mfg. Co., Inc. Analog waveform digitizer. 4,297,680, Cl. 340-347.0AD.
Koenig, Fredrick: *See*—
Rodenbeck, Philip G.; and Koenig, Fredrick, 4,296,784, Cl. 140-92.200.
Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, to BASF Aktiengesellschaft. Novel α-haloalkylcarbamic acid halides, and a process for the preparation of α-haloalkylcarbamic acid halides. 4,297,300, Cl. 260-544.00C.
Koffski, Leonard E. Bracket. 4,296,835, Cl. 182-184.000.
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, to Chisso Corporation. Novel disubstituted dichlorosilane and method for producing same. 4,297,499, Cl. 556-465.000.
Kohno, Kimio: *See*—
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.
Kohsaka, Masanobu: *See*—
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Koike, Toshio: *See*—
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.
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Niiro, Yasuhiko; Furusawa, Kahei; and Okada, Akira, 4,296,996, Cl. 350-96.200.
Kolb, Gerald C.: *See*—
De Koch, Robert J.; Kolb, Gerald C.; and Lalk, James W., 4,297,452, Cl. 525-367.000.
Kolb, Gustav, to Mannesmann Aktiengesellschaft; and Kolb, Gustav. Sampling molten metal. 4,296,638, Cl. 73-863.210.
Koleske, Joseph V., to Union Carbide Corporation. Ester diol alkoxylate based alkyd resins. 4,297,476, Cl. 528-300.000.
Koller & Smith Co., Inc.: *See*—
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, 4,297,570, Cl. 235-493.000.
Kolowski, Michael A.: *See*—
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Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, to Mitsubishi Gas Chemical Co. Inc. Process and apparatus for producing terephthalic acid with high purity. 4,297,507, Cl. 562-416.000.
Kominami, Yasuo: *See*—
Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,297,601, Cl. 307-555.000.
Komiya, Hidetsugu, to Fujitsu Fanuc Limited. Spindle control system. 4,297,624, Cl. 318-594.000.
Kondo, Yoshinobu: *See*—
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,296,944, Cl. 280-804.000.
Konig, Klaus: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.
Koning, Menno G., to Northrop Corporation. Free rotor gyro with three torquers and three pickoffs. 4,296,639, Cl. 74-5.460.
Konishiroku Photo Industry Co., Ltd.: *See*—
Honda, Hiroyuki; and Ura, Hiroaki, 4,297,026, Cl. 355-15.000.
Kamogawa, Nin-ichi; and Ito, Takashi, 4,297,562, Cl. 219-216.000.
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.
Nagoshi, Mitsuru, 4,297,023, Cl. 355-8.000.
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.
Koons, Patrick R.; and Neilson, John M. S., to RCA Corporation. Method of treating SiPOS passivated high voltage semiconductor device. 4,297,149, Cl. 148-1.500.
Kornrumpf, William P.: *See*—
Bloomer, Milton D.; and Kornrumpf, William P., 4,296,632, Cl. 73-362.0AR.
Kosek, Thomas P.; and Steinhilper, Eric A., to General Motors Corporation. Powdered coal air dispersion nozzle. 4,296,888, Cl. 239-403.000.
Koseki, Yuji: *See*—
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.
Koshibe, Shigeru; and Nanjo, Motoyuki, to Sumitomo Bakelite Company Limited. Quick-curing phenolic resin and process for preparing same. 4,297,473, Cl. 528-144.000.
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, to Koller & Smith Co., Inc. Magnetic stripe. 4,297,570, Cl. 235-493.000.
Kowitz, Friedrich: *See*—
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, to Hitachi Chemical Company, Ltd. Odorless or low-odor crosslinkable compound and resin composition containing the same. 4,297,471, Cl. 526-328.000.
Kozacka, Frederick J., to Gould Inc. Fusible electric cable protector. 4,297,667, Cl. 337-251.000.
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, to BASF Aktiengesellschaft. Preparation of coated catalysts. 4,297,247, Cl. 252-468.000.
Kraft, Raymond D.: *See*—
Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., 4,297,094, Cl. 431-202.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Schabert, Hans-Peter, 4,297,167, Cl. 376-273.000.
Weghaupt, Erich, 4,297,603, Cl. 310-53.000.
Wichmann, Arnold, 4,297,606, Cl. 310-271.000.
Krall, Kenneth M., to Vought Corporation. Airfoil construction. 4,296,900, Cl. 244-219.000.
Kratzer, Reinhold H.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., 4,297,510, Cl. 564-13.000.
Krauss, Timothy A.; and Roman, Stephan, to United Technologies Corporation. Rotor blade pitch control linkage. 4,297,080, Cl. 416-141.000.
Krawczyk, Adam: *See*—
Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, 4,297,305, Cl. 264-0.500.
Kremer, Hubert, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Double-lift open-shed Jacquard machine. 4,296,782, Cl. 139-65.000.
Kress, Robert W.; and Bacchi, Anthony C., to Grumman Aerospace Corporation. VTOL Airplane. 4,296,896, Cl. 244-12.400.
Krjuk, Timur P.: *See*—
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.
Kroger, Walter. Folding sawhorse. 4,296,834, Cl. 182-155.000.
Kroll, Rudolf: *See*—
Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,296,732, Cl. 126-426.000.
Kronert, Curt, to Thyssen Industrie AG. Rotation-elastic, shock and vibration damping clutch. 4,296,853, Cl. 192-106.100.
Krueger, Walter J.: *See*—
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.
Krug, Hans; and Heilmann, Kurt, to Ferd. Wagner. Gold alloy wire for jewelry chains. 4,297,416, Cl. 428-576.000.
Kruse, Gary L., to Dake Corporation, Division of JSJ Corporation. Packaging machine with cam-operated cutter and container supports therefor. 4,296,589, Cl. 53-300.000.

Kubinski, Karen R.: *See*—
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.

Kubo, Tatsuru: *See*—
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.

Kubota, Ltd.: *See*—
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.
Sada, Kenzo; and Hayashi, Shigeyuki, 4,296,644, Cl. 74-606.00R.

Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, to Fuji Photo Film Co., Ltd. Method for producing a multilayer printing plate. 4,297,436, Cl. 430-310.000.

Kuchuk-Yatsenko, Sergei I.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, to Fuji Photo Film Co., Ltd. Method of developing electrostatic latent image. 4,297,384, Cl. 427-14.100.

Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, to Siemens Aktiengesellschaft. Electromagnetic overcurrent tripping device with adjustable armature air gap. 4,297,664, Cl. 335-176.000.

Kuhlmann, Dieter: *See*—
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.

Kuiper, Joe A.: *See*—
DeVisser, Richard B.; Rishel, John W.; and Kuiper, Joe A., 4,297,209, Cl. 210-107.000.

Kullander, Jan O., to Aktiebolaget Electrolux. Knock-down cabinet assembly. 4,296,982, Cl. 312-257.00R.

Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., to Charles Stark Draper Laboratory, Inc., The. Process of making permanent magnets. 4,297,388, Cl. 427-47.000.

Kumpe, Gerhardt: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Herchenhan, Bernd, 4,297,344, Cl. 424-101.000.

Kunchal, S. Kumar: *See*—
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Kupar, Daniel E.: *See*—
Fruchey, Russell L.; and Kupar, Daniel E., 4,297,672, Cl. 340-23.000.

Kuraray Company, Ltd.: *See*—
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, 4,297,315, Cl. 264-322.000.

Kurata, Tomoyuki: *See*—
Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, 4,296,705, Cl. 114-219.000.

Kureha Kugaku Kogyo Kabushiki Kaisha: *See*—
Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, 4,297,413, Cl. 428-394.000.

Kurtz, Leonard D.; and Bidwell, Robert E., to BioResearch Inc. Underwater drainage apparatus with separable suction control chamber. 4,296,748, Cl. 128-276.000.

Kurz, Rainer: *See*—
Arbel, Arie; and Kurz, Rainer, 4,297,679, Cl. 340-347.0AD.

Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., to Pacer Technology and Resources, Inc.; and Sumitomo Chemical Company, Ltd. Locking and sealing compositions and methods for their application. 4,297,160, Cl. 156-331.100.

Kusters, Eduard; and Ahrweiler, Karl-Heinz, to Kusters, Eduard. Variable deflection roll controlled by hydraulically actuated reciprocating elements. 4,296,537, Cl. 29-116.0AD.

Kvist, Ulrik: *See*—
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Kyle, Benjamin G., to Kansas State University Research Foundation. Low energy process of producing gasoline-ethanol mixtures. 4,297,172, Cl. 203-19.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, 4,297,369, Cl. 424-285.000.

Labovitz, Jeffrey N.: *See*—
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Lacomme, Philippe, to Thomson-CSF. Telemetry device for tracking radar and radar system comprising such a device. 4,297,703, Cl. 343-7.300.

Ladin, Eli M., to Federal-Mogul Corporation. Self-aligning shaft bearing mounting assembly. 4,296,977, Cl. 308-19.000.

Ladish Co.: *See*—
Zimmerly, Robert D., 4,296,951, Cl. 285-95.000.

LaFrance, Robert R. X-ray system signal derivation circuits for heat unit indicators and/or calibration meters. 4,297,638, Cl. 324-410.000.

Lai, John T., to B. F. Goodrich Company, The. Synthesis of 2-keto-1,4-diazacycloalkanes. 4,297,497, Cl. 544-384.000.

L'Air Liquide, Societe Anonyme pour l'Etude Procedes Georges Claude: *See*—
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, 4,297,298, Cl. 260-502.00R.

Laird, William J.: *See*—
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.

Laishley, William J.; and Taylor, John R., to International Business Machines Corporation. Sampled data servo positioning system. 4,297,734, Cl. 360-78.000.

Lalk, James W.: *See*—
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Lamare, Jacques: *See*—
Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy, 4,296,791, Cl. 160-206.000.

Lammers, Gerald B.; and Smith, Gordon J., to International Business Machines Corporation. Air flow tunnel for reducing ink jet drag on array head. 4,297,712, Cl. 346-75.000.

Lamos, Richard A.: *See*—
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.

Lampinen, Esko; and Kajavo, Kari, to Oy Helvar. Casing hook used to impregnate choke or transformer. 4,296,545, Cl. 29-602.00R.

Land Pyrometers Limited: *See*—
Coe, Charles D.; and Wright, Philip, 4,297,577, Cl. 250-343.000.

Lange, Kenneth: *See*—
Malinowski, Leon; and Lange, Kenneth, 4,296,818, Cl. 171-63.000.

Lapp, Otto: *See*—
Bergthaller, Peter; Saleck, Wilhelm; Lapp, Otto; and Mucke, Bruno, 4,297,439, Cl. 430-434.000.

Larinoff, Michael W., to Hudson Products Corporation. Steam condensing apparatus. 4,296,802, Cl. 165-110.000.

Larre, Frank J.; and Larre, Jeannine G. Book support. 4,296,946, Cl. 281-45.000.

Larre, Jeannine G.: *See*—
Larre, Frank J.; and Larre, Jeannine G., 4,296,946, Cl. 281-45.000.

Larsen, Donald W.: *See*—
Wood, Louis L.; and Larsen, Donald W., 4,297,482, Cl. 528-405.000.

Larsen, Robert H., to Singer Company, The. Threading arrangement for chainstitch sewing on a sewing machine. 4,296,701, Cl. 112-168.000.

Larsen, Russell E. Game board and cards. 4,296,927, Cl. 273-248.000.

Larson, Leslie. Drilling rig and conversion apparatus. 4,296,821, Cl. 175-87.000.

Larson, Roderick W.; and Whaley, Ralph D., to Minnesota Mining and Manufacturing Company. Multi-conductor flat cable connector. 4,296,989, Cl. 339-99.00R.

Larsson, Lars E., to Sandvik Aktiebolag. Rock drill. 4,296,825, Cl. 175-410.000.

Lasley, Robert A. Hyperbaric oxygen chamber with fluidic control. 4,296,743, Cl. 128-30.000.

Lauritsen, Richard L.; and Mandellos, Panagiotis K., to Singer Company, The. Vacuum switch. 4,297,552, Cl. 200-83.00P.

Laval, Michel; and Tournier, Edmond, to Commissariat a l'Energie Atomique. Device for the interconnection of conductive terminals located within a demountable enclosure and conductive terminals located outside said enclosure. 4,297,576, Cl. 250-336.000.

Lawless, William N., to Corning Glass Works. Cryogenic ceramic and apparatus. 4,296,607, Cl. 62-6.000.

Lawless, William N., to Corning Glass Works. Cryogenic ceramic and apparatus. 4,296,608, Cl. 62-6.000.

Lawrence, Peter. Picture frame having integral latching means. 4,296,561, Cl. 40-158.00R.

Lawson, Daniel C. Toilet seat lock. 4,296,504, Cl. 4-253.000.

Lawson, John E.; and Dennis, Ronald D., to Mead Johnson & Company. 4-Tertiary-amino-2,6-diaminopyridine 1-oxides. 4,297,498, Cl. 546-116.000.

Layotte, Pierre-Claude; and James, Andre, to Institut Francais du Petrole. Mobil device for generating acoustic shear waves. 4,296,828, Cl. 181-121.000.

Leyton, James E., to Phillips Petroleum Company. Gain ranging amplifier. 4,297,745, Cl. 367-66.000.

Lazarz, Christine A.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corp. Stable low voltage microporous diaphragm for electrolytic cells. 4,297,196, Cl. 204-296.000.

Leardi, Anthony, to Hercules Incorporated. In-tank bathroom deodorizer/cleaner. 4,296,503, Cl. 4-228.000.

Learnard, Stanley J. Article display stand. 4,296,866, Cl. 211-131.000.

Leatherman, Ivan R., to PPG Industries, Inc. Hexavalent chromium internal colorants for diol bis (allyl carbonate) polymerizates. 4,297,267, Cl. 260-42.530.

Lebedev, Vladimir K.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Lechner, Robert: *See*—
Dalhof, Axel; and Lechner, Robert, 4,297,531, Cl. 179-16.0AA.

Leclercq, Joseph, to Framatome. Devices for transversely holding the fuel rods of a nuclear reactor assembly. 4,297,170, Cl. 376-442.000.

Lecolier, Serge L.; and Senet, Jean-Pierre G., to Societe Nationale des Poudres et Explosifs. Process for the manufacture of organic acid chlorides. 4,297,301, Cl. 260-544.00K.

Lee, Byung H. Aircraft safety alarm system. 4,297,678, Cl. 340-328.000.

Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, to Canadian General Electric Company Limited. Nuclear fuel recycling system. 4,297,305, Cl. 264-0.500.

Lee, Ilyoul, to Electric Power Research Institute, Inc. Apparatus for and method of detecting high impedance faults on distribution circuits with delta connected loads. 4,297,738, Cl. 361-42.000.

Lee, Peter F., to Weyerhaeuser Company. Process for displacement washing of porous media. 4,297,164, Cl. 162-60.000.

Lee, Sukoo. Surgical stapler using cartridge. 4,296,881, Cl. 227-30.000.
Lees, Robert, to Autotote, Ltd. Thermal printer. 4,297,039, Cl. 400-120.000.
Lefebvre, Henry R., to Sun Aired Bag Co., Inc. Garment checking bag. 4,296,876, Cl. 223-91.000.
Lehinant, Armand: *See*—
von der Eltz, Hans-Ulrich; Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,297,101, Cl. 8-531.000.
Lehman, John C., to John C. Lehman, Inc. Cabinet storage conveyor. 4,296,984, Cl. 312-268.000.
Lehmann, Joachim W.: *See*—
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Leighton, John D., to Leighton, Betty, a part interest. Method and construction for vehicle brake pedal and switch assembly. 4,297,550, Cl. 200-61.890.
Leitner, Lutz: *See*—
Buxbaum, Gunter; Schopper, Heinrich-Christian; Leitner, Lutz; and Hahnkamm, Volker, 4,297,395, Cl. 427-127.000.
LEK, tovarna farmacevtskih in kemicnih izdelkov. n.sol.o.: *See*—
Suhac, Peter; Hafner-Milac, Natasa; and Dolenc, Bozidar, 4,297,293, Cl. 260-448.00B.
Leland Stanford University, Board of Trustees of: *See*—
Trutna, William R., Jr., 4,297,600, Cl. 307-426.000.
Leliaert, Raymond M., to Wheelabrator-Frye Inc. Method of transmission of sonic energy to work pieces. 4,296,794, Cl. 164-131.000.
Lempa, Bernard J., Jr. Method for offset anchoring a fence post. 4,296,584, Cl. 52-742.000.
Lengsfeld, Franz: *See*—
Muller, Rudolf; Lengsfeld, Franz; and Uerlichs, Johannes, 4,296,776, Cl. 137-340.000.
Leon's Manufacturing Co., Ltd.: *See*—
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Leroux, Alain: *See*—
Chenaux, Bernard; and Leroux, Alain, 4,297,420, Cl. 429-217.000.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., to Sterling Drug Inc. 5-(Pyridinyl)pyridine-2,3-diamines, preparation thereof and their cardiotonic use. 4,297,360, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 4-(3,4-Diaminophenyl)pyridine or salts, and use thereof as cardiotonic. 4,297,362, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 2-Amino-3(4 or 5)-(pyridinyl)phenols and their use as cardiotonics. 4,297,363, Cl. 424-263.000.
Lesser, Martin: *See*—
Rossander, Bror L. E.; Ermebrant, Lennart C.; and Lesser, Martin, 4,296,830, Cl. 181-208.000.
Lester, Robert W., to Static Systems Corporation. Light pipe valve liquid crystal transmissive display for direct imaging on photosensitive materials. 4,297,022, Cl. 355-3.00R.
Leuchs, Ottmar; and Maltz, Georg, to Kabel-und Metallwerke Gutehoffnungshuette A.G. Fire resistant electrical cables. 4,297,526, Cl. 174-102.00R.
Leuschner, Gunter: *See*—
Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, 4,297,323, Cl. 422-208.000.
Lever Brothers Company: *See*—
Furrier, Joseph P.; and Gilbert, Allan H., 4,296,518, Cl. 15-110.000.
Metcalfe, John L.; and Wraige, Douglas, 4,297,406, Cl. 428-215.000.
Lewis, Jay L., to Robertshaw Controls Company. Pneumatically operated control system and unit therefor and methods of making the same. 4,296,795, Cl. 165-27.000.
Lewis, John S.; DiGiannantonio, Edmond P.; and Boyle, Howard R., to Lewis, John S.; and DiGiannatonio, Edmund P. Personal ambient sound referenced annunciator. 4,297,677, Cl. 340-148.000.
Lexa, Anthony F.: *See*—
Brunson, William T.; and Lexa, Anthony F., 4,297,581, Cl. 250-391.000.
LGZ Landis & Gyr Zug AG: *See*—
Antes, Gregor; and Greenaway, David L., 4,297,001, Cl. 350-129.000.
Gander, Jean-Gabriel; and Aubert, Ralph, 4,297,533, Cl. 179-84.0VF.
Li, Chou H. Semiconductor device. 4,297,717, Cl. 357-15.000.
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., to Allied Chemical Coporation. Apparatus for texturizing continuous filaments. 4,296,535, Cl. 28-257.000.
Libbey-Owens-Ford Company: *See*—
Reed, Ronald R.; Crone, William F., Jr.; and Meyer, G. Robert, 4,296,662, Cl. 83-880.000.
Licitis, Gunars: *See*—
Meyer, Burton C.; Licitis, Gunars; and Brand, Derek A., 4,296,929, Cl. 273-310.000.
Lidik, Albert F.; and Talley, Randall E., III. Can crusher. 4,296,683, Cl. 100-53.000.
Liland, Alfred L.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,296,535, Cl. 28-257.000.
Lincoln-Helios GmbH: *See*—
Rodemer, Karl, 4,296,777, Cl. 137-351.000.
Linde Aktiengesellschaft: *See*—
Schliebener, Claus; and Wernicke, Hans J., 4,297,204, Cl. 208-95.000.
Lindmayer, Joseph, to Solarex Corporation. Method of applying electrical contacts to a photovoltaic cell. 4,297,391, Cl. 136-256.000.
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, to Bayer Aktiengesellschaft. ABS-moulding compositions having high notched impact strength. 4,297,446, Cl. 525-66.000.
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid aryl esters of polyester-diols lengthened via carbonate groups and their use for the preparation of polyester-diol bis-diphenol carbonates and polyester/-polycarbonates. 4,297,455, Cl. 525-439.000.
Lindner, Daniel J.: *See*—
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.
Lindstrom, YrjoV., to Alnor Oy. Method and device for measuring the required cooling capacity of a cold space and the refrigeration capacity of the refrigerating machinery. 4,296,627, Cl. 73-15.00R.
Lingaraju, Bhartoor, to Square D Company. Pressure lock terminal. 4,296,987, Cl. 339-95.00D.
Link, Hans; and Dreher, Ulrich, to Institut Dr. Friedrich Forster Prufgeratebau. Magnet and probe mounting means on a rotating head of magnetic defect testing apparatus. 4,297,636, Cl. 324-262.000.
Lionelle, Joseph E.; and Staffa, Jeffrey A., to Bio Systems Research, Inc. Method of preparing the methyl ester of α-eleostearic acid. 4,297,291, Cl. 260-410.90R.
Lippa, Giuseppe, to American Standard Inc. Mold for integral base for casting ceramic material in the form of a slip. 4,296,908, Cl. 249-58.000.
Liquid Paper Corporation: *See*—
Ferree, William I., Jr.; and Nguyen, Giao V., 4,297,260, Cl. 260-29.70H.
List, Hans: *See*—
Claassen, Peter; List, Helmut; and Zeiringer, Rudolf, 4,296,635, Cl. 73-730.000.
List, Helmut: *See*—
Claassen, Peter; List, Helmut; and Zeiringer, Rudolf, 4,296,635, Cl. 73-730.000.
Little, Donald R., to American Standard Inc. Vital incidental movement monitoring arrangement. 4,297,548, Cl. 200-61.080.
Little, Jane; and Greene, Del F., to McDonnell Douglas Corporation. Tandem hydraulic actuator. 4,296,677, Cl. 91-510.000.
Liu, Anh-Thu: *See*—
Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, 4,297,325, Cl. 423-122.000.
Liu, Hsin. Equipment for treating and resource recovery from solid waste. 4,297,322, Cl. 422-184.000.
Livigni, Russell A.: *See*—
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.
Livingstone, Bryan: *See*—
Hannah, Stephen J.; and Livingstone, Bryan, 4,297,176, Cl. 204-37.00R.
Llorach, Alfredo B. Devices to exploit solar energy. 4,296,735, Cl. 126-438.000.
Lobl, Thomas J.: *See*—
Babcock, John C.; Campbell, J. Allan; and Lobl, Thomas J., 4,297,350, Cl. 424-238.000.
LoCascio, James J.; and Jarrett, Robert B., to Motorola Inc. Current mirror circuit. 4,297,646, Cl. 330-288.000.
Lockheed Corporation: *See*—
Donham, Robert E.; and Heimbold, Richard L., 4,297,076, Cl. 416-37.000.
Lockheed Missiles & Space Company, Inc.: *See*—
Buchanan, Robert A.; Maple, T. Grant; and Sklensky, Alden F., 4,297,584, Cl. 250-483.000.
Loftis, James B. Drilling apparatus. 4,296,820, Cl. 175-52.000.
Logan, Ted J.; and Lubsen, Timothy A., to Procter & Gamble Company, The. Fractionation of triglyceride mixtures. 4,297,292, Cl. 260-428.500.
Lohmer, Karl: *See*—
Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, 4,297,438, Cl. 430-377.000.
Lohr, Robert. Apparatus for use on vehicle transporters. 4,296,691, Cl. 105-370.000.
Lok-A-Wat, Inc.: *See*—
Belles, David E., 4,296,957, Cl. 292-264.000.
Lok, Brent M. T.; and Izod, Thomas J. P., to Union Carbide Corporation. Aluminum deficient zeolite compositions and process for preparing same. 4,297,335, Cl. 423-328.000.
Long, William P., Jr., to ICI Americas Inc. Non-yellowing paint formulations containing iodo substituted alkynyl urethanes as fungicides. 4,297,258, Cl. 260-29.6MN.
Looren de Jong, Hendrikus: *See*—
Melwisch, Harald; and Looren de Jong, Hendrikus, 4,297,731, Cl. 360-70.000.
L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henry, 4,297,102, Cl. 8-406.000.
Lorenzini, Robert A. Reed protector for a woodwind instrument. 4,296,668, Cl. 84-383.00R.
Lorke, Horst: *See*—
Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, 4,297,236, Cl. 252-389.00R.

Los, Marinus, to American Cyanamid Co. Use of imidazolinyl benzoates as herbicidal agents. 4,297,128, Cl. 71-92.000.

Loser, Norbert; and Tilgner, Leopold, to SKF Kugellagerfabriken GmbH. Sliding bearing. 4,296,978, Cl. 308-37.000.

Love, Phillip W. Self-loading apparatus for transporting large bales of material. 4,297,065, Cl. 414-24.500.

Lovelace, Reginald B.: *See*—
Claffy, Richard D.; and Lovelace, Reginald B., 4,296,771, Cl. 137-110.000.

Low, Teresa L. K.: *See*—
Goldstein, Allan L.; and Low, Teresa L. K., 4,297,276, Cl. 260-112.50R.

Lowe, Virgil L. Charged coupled device time base corrector system. 4,297,728, Cl. 360-36.000.

Lowrey, Robert D.: *See*—
Chern, Mao-Jin; and Lowrey, Robert D., 4,297,401, Cl. 428-1.000.

Lubow, Allen. Needle threader. 4,296,877, Cl. 223-99.000.

Lubsen, Timothy A.: *See*—
Logan, Ted J.; and Lubsen, Timothy A., 4,297,292, Cl. 260-428.500.

Lucas Industries Limited: *See*—
Nicol, Thomas; Wiley, David; and Allport, Maurice J., 4,297,631, Cl. 320-64.000.
Tregurtha, Steven J.; and Cryer, Edward, 4,297,549, Cl. 200-61.270.

Luebke, Robert W., to True Temper Corporation. Containment reservoir and method. 4,296,884, Cl. 238-2.000.

Luerken, Adolf, to McCulloch Corporation. Automatic two-way centrifugal clutch for motor driven apparatus. 4,296,852, Cl. 192-104.00B.

Luginbuhl, Rolf: *See*—
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,774, Cl. 137-322.000.
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,775, Cl. 137-322.000.

Lundgren, Sune I.; and Rehnberg, Leif E. L., to Kemi-Intressen AB. Method and a device for removing corks from vessels. 4,296,653, Cl. 81-3.46R.

Lutz, Albert W.; and Diehl, Robert E., to American Cyanamid Company. Herbicidal use of 2,6-dinitroaniline herbicides. 4,297,127, Cl. 71-88.000.

Lutz, Andre: *See*—
Heymes, Rene; and Lutz, Andre, 4,297,352, Cl. 424-246.000.

Lyall, Brian: *See*—
Ward, Herbert J.; Dobbie, Derek J.; and Lyall, Brian, 4,297,415, Cl. 428-516.000.

Lynch, John E.: *See*—
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.

Lynch, Mark: *See*—
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.

Lynn, Ray E.: *See*—
Simmons, Dwane P.; and Lynn, Ray E., 4,296,509, Cl. 5-81.00R.

Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., to Panametrics, Inc. Sealed, matched piezoelectric transducer. 4,297,607, Cl. 310-334.000.

Lyons, David J.: *See*—
Mezrich, Reuben S.; Colleoni, Alec; and Lyons, David J., 4,297,009, Cl. 352-86.000.

M & W Gear Company: *See*—
Meiners, Elmo R., 4,296,595, Cl. 56-341.000.

Ma, King W., to Dow Chemical Company, The. Method of oxidizing compounds having activated methylene radicals. 4,297,514, Cl. 568-321.000.

Maahs, Gunther; and Rombusch, Konrad, to Chemische Werke Huels, Aktiengesellschaft. Process for the preparation of pentachloro-3-butenoic acid esters. 4,297,505, Cl. 560-219.000.

Macchiarolo, Nick T.; McGuire, Billy G.; and Scalise, John M., to Great Lakes Chemical Corporation. Method for the control of biofouling in recirculating water systems. 4,297,224, Cl. 210-755.000.

Mack, Gerhard: *See*—
Muller, Klaus; and Mack, Gerhard, 4,296,530, Cl. 24-295.000.

Maeda, Keisuke: *See*—
Matsumoto, Toshiaki; and Maeda, Keisuke, 4,297,015, Cl. 354-25.000.

Maegawa, Yuzo; Masuko, Fujio; and Nakamura, Makoto, to Sumitomo Chemical Company, Limited. Process for producing 2 hydroxy-naphthalene-3-carboxylic acid. 4,297,508, Cl. 562-425.000.

Maeno, Hiroo: *See*—
Yamamoto, Minoru; Tachikawa, Shiro; and Maeno, Hiroo, 4,297,356, Cl. 424-248.570.

Magnus, Paul G., to Magnusystem, Inc. Sectional pipe and tubular members for forming same. 4,296,781, Cl. 138-155.000.

Magnusystem, Inc.: *See*—
Magnus, Paul G., 4,296,781, Cl. 138-155.000.

Mai, Wolfgang: *See*—
Weller, Alois; and Mai, Wolfgang, 4,296,625, Cl. 72-345.000.

Maier, Hans-Peter: *See*—
von der Eltz, Hans-Ulrich; Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,297,101, Cl. 8-531.000.

Maier, Lawrence C., to Simmonds Precision Products, Inc. Segment failure detector for digital display. 4,297,692, Cl. 340-715.000.

Mainusch, Klaus; Schleppinghoff, Bernhard; and Munter, Klaus, to EC Erdolchemie GmbH. Process for the preparation of triethylamine. 4,297,512, Cl. 564-490.000.

Makari, Jack G. Malignant tumor immunity level detection. 4,297,338, Cl. 424-9.000.

Makino, Akira, to Nisshin Oil Mills, Ltd., The. Rapid method for the measurement of iodine value. 4,297,106, Cl. 23-230.0HC.

Makino, Itsuo: *See*—
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,297,280, Cl. 260-245.500.

Makino, Masaharu: *See*—
Sato, Hisatake; Makino, Masaharu; and Hayashi, Hideo, 4,297,450, Cl. 525-333.000.

Makofka, Stanley J.: *See*—
Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., 4,296,593, Cl. 56-98.000.

Malinowski, Leon; and Lange, Kenneth, to Leon's Manufacturing Co., Ltd. Rotary rock picker. 4,296,818, Cl. 171-63.000.

Mallinckrodt, Inc.: *See*—
Vitello, John P.; and Grummon, Glenn D., 4,296,785, Cl. 141-105.000.

Malsot, Christian; and Bouygues, Jean, to Socapex. Device for centering an optical fiber within a terminal, and a terminal constructed by means of said device. 4,296,997, Cl. 350-96.200.

Maltz, Georg: *See*—
Leuchs, Ottmar; and Maltz, Georg, 4,297,526, Cl. 174-102.00R.

Manca, Francesco, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Finish composition for the spinning of highly crimped cellulose fibers using a composition cont. fatty acid ester, organic phosphoric acid ester, fatty acid ethylene oxide cond. prod. and fatty acid salt. 4,297,407, Cl. 428-224.000.

Mandellos, Panagiotis K.: *See*—
Lauritsen, Richard L.; and Mandellos, Panagiotis K., 4,297,552, Cl. 200-83.00P.

Manecke, Siegfried E.; and Buckshaw, Thomas M., to Robertshaw Controls Company. Temperature responsive piston and cylinder unit having a heater carried thereby. 4,296,603, Cl. 60-528.000.

Mango, Frank D., to Shell Oil Company. Process for making 4,4'-methylene diphenyl diisocyanate. 4,297,294, Cl. 260-453.0PH.

Mangold, Dietrich: *See*—
Reissenweber, Gernot; and Mangold, Dietrich, 4,297,491, Cl. 544-105.000.

Mannesmann Aktiengesellschaft: *See*—
Kolb, Gustav, 4,296,638, Cl. 73-863.210.

Mannherz, Elmer D., to Fischer & Porter Co. Noise-reducing electrodes for electromagnetic flowmeter. 4,296,636, Cl. 73-861.120.

Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., to Corning Glass Works. Solid-phase immunoassays using magnetic glass. 4,297,337, Cl. 424-1.000.

Manzke, Klaus; Brotzler, Roland; and Schulze-Berge, Klaus, to BASF Aktiengesellschaft. Device for adjusting and fixing detecting means relative to the index mark on a recording disc. 4,297,736, Cl. 360-109.000.

Maple, T. Grant: *See*—
Buchanan, Robert A.; Maple, T. Grant; and Sklensky, Alden F., 4,297,584, Cl. 250-483.000.

Marchelli, Francesco: *See*—
Sbuelz, Anes; and Marchelli, Francesco, 4,297,649, Cl. 331-2.000.

Marer, Joseph, to Redon Trust. Remote control device for activating or inactivating a pneumatic war mine. 4,296,686, Cl. 102-427.000.

Markfelder, Gunther: *See*—
Hofmann, Heinrich; and Markfelder, Gunther, 4,296,979, Cl. 308-174.000.

Markham, Harvey R.: *See*—
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.

Marko Materials, Inc.: *See*—
Giessen, Bill C.; Polk, Donald E.; and Ray, Ranjan, 4,297,135, Cl. 75-123.00B.

Marks, Helmut: *See*—
Moll, Hans-Georg; Hasselbarth, Ulrich; Grohmann, Andreas; and [illegible]rks, Helmut, 4,297,221, Cl. 210-702.000.

Marlin r[illegible]arms Company, The: *See*—
Oberst, E. Ernest, 4,296,564, Cl. 42-1.00C.

Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., to Hughes Aircraft Company. Phase sensitive spectrum analyzer. 4,297,704, Cl. 343-113.00R.

Marquart, Gordon L., to Deere & Company. Hydraulically operated transmission control. 4,296,649, Cl. 74-751.000.

Marsden, Robert S., to Imperial Chemical Industries Limited. Preparation of solutions of basic aluminium nitrate. 4,297,336, Cl. 423-395.000.

Marsh, Walter H. W.: *See*—
Davidson, Donald R.; and Marsh, Walter H. W., 4,296,698, Cl. 112-110.000.

Marshall, Don J., to Goodall SemiMetallic Hose & Mfg. Co. Variable pitch marine propeller. 4,297,079, Cl. 416-140.000.

Marshall, Richard C., to Xerox Corporation. Electrochromic display device. 4,297,695, Cl. 340-752.000.

Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., to Sperry Corporation. Damped apparatus for quick-stopping rotating members. 4,296,591, Cl. 56-10.300.

Martens, Gerhard, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Method and apparatus for winding textile yarns. 4,296,889, Cl. 242-18.100.

Martin, Alfred C., to Westland Aircraft Limited. Helicopter rotors. 4,297,078, Cl. 416-134.00A.

Martin, Anthony N., to Otis Elevator Company. Electronic fuel control system. 4,296,601, Cl. 60-224.000.

Martin, Charles L., to Raychem Corporation. Composite coupling device with high recovery driver. 4,296,955, Cl. 285-381.000.
Martin Marietta Corporation: *See*—
Perz, John S., 4,297,399, Cl. 427-385.500.
Martin, William L.: *See*—
Stalder, John L.; and Martin, William L., 4,296,814, Cl. 166-303.000.
Marui Industry Co., Ltd.: *See*—
Takeguchi, Masanobu; and Oyobe, Isao, 4,297,222, Cl. 210-748.000.
Marvin Glass & Associates: *See*—
Erickson, Erick E.; Katzman, Allison W.; and Breslow, Jeffrey D., 4,297,153, Cl. 156-63.000.
Meyer, Burton C.; Licitis, Gunars; and Brand, Derek A., 4,296,929, Cl. 273-310.000.
Maryland Cup Corporation: *See*—
Stokkers, Henk, 4,296,863, Cl. 206-504.000.
Maschinenfabrik Carl Zangs Aktiengesellschaft: *See*—
Kremer, Hubert, 4,296,782, Cl. 139-65.000.
Mascitti, Albert A.: *See*—
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,297,373, Cl. 424-322.000.
Mason, Stanley I., Jr.; and Handler, Michael D., to Surgikos. Disposable full-face surgical mask. 4,296,746, Cl. 128-201.150.
Massa, Frank, to Stoneleigh Trust, The, Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees. Resonant electroacoustic transducer with increased band width response. 4,297,538, Cl. 179-180.000.
Massuard, Claude: *See*—
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., 4,297,743, Cl. 364-200.000.
Mast, Harm, to Shell Oil Company. System for detecting particles carried by a fluid flow. 4,296,628, Cl. 73-28.000.
Masuda, Hirotsugu: *See*—
Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, 4,296,705, Cl. 114-219.000.
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, to Dainippon Screen Seizo Kabushiki Kaisha; and Takara Belmont Co., Ltd. Method and machine for trying on a hair form in image. 4,297,724, Cl. 358-93.000.
Masuko, Fujio: *See*—
Maegawa, Yuzo; Masuko, Fujio; and Nakamura, Makoto, 4,297,508, Cl. 562-425.000.
Matherat, Philippe, to Thomson-CSF. Symbol generator for a graphic console. 4,297,694, Cl. 340-750.000.
Matsumoto, Hisasl. , to Mitsui Petrochemical Industries, Ltd. Reinforcing material for hydraulic substances and method for the production thereof. 4,297,414, Cl. 428-400.000.
Matsumoto, Mitsuo: *See*—
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, 4,296,597, Cl. 57-205.000.
Matsumoto, Shinichi: *See*—
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.
Matsumoto, Toshiaki; and Maeda, Keisuke, to Minolta Camera Kabushiki Kaisha. Came:a automatic focus apparatus. 4,297,015, Cl. 354-25.000.
Matsunaga, Hirokazu: *See*—
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.
Matsuo, Munetsugu: *See*—
Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, 4,296,919, Cl. 266-111.000.
Matsuoka, Hideoki; and Kondo, Yoshinobu, to Nissan Motor Company, Limited; and Fuji Kiko Co., Ltd.,. Covering construction of a guide rail. 4,296,944, Cl. 280-804.000.
Matsushima, Hiroaki: *See*—
Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, 4,297,166, Cl. 376-194.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,296,543, Cl. 29-596.000.
Hirao, Tsuneo; and Onishi, Masao, 4,297,609, Cl. 310-339.000.
Matsutani, Shigeru: *See*—
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,297.280, Cl. 260-245.500.
Mattel, Inc.: *See*—
Buck, Gordon H.; and Hardwick, Martha K., 4,296,926, Cl. 273-86.00R.
Matthews, Gerald H.: *See*—
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.
Matthijsse, Matthijs, to U.S. Philips Corporation. Device having a balanced pivotable arm. 4,296,906, Cl. 248-280.100.
Mattsson, Karl-Erik H., to AB Volvo. Cylinder with two-stage movement, especially a welding cylinder. 4,296,679, Cl. 92-52.000.
Maul, Rudolf: *See*—
Abeler, Gerd; and Maul, Rudolf, 4,297,268, Cl. 260-45.80N.
Maulding, Hawkins V., to Sandoz, Inc. Non-irritating injectable dosage forms. 4,297,353, Cl. 424-247.000.
May, James I., to Ford Motor Company. Rack and pinion gear bearing support. 4,296,641, Cl. 74-422.000.
Mayer, George: *See*—
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, 4,297,570, Cl. 235-493.000.
McCarty, Frederick B.: *See*—
Burgmeier, Lyman R.; McCarty, Frederick B.; and Silver, Alexander, 4,296,544, Cl. 29-598.000.
McClinton, John L., to Burns and Russell Company, The. Pigment package. 4,296,859, Cl. 206-219.000.
McConomy, Thomas A.; and Wells, Bruce D., to Calgon Corporation. Process for removing color bodies from brown phosphoric acid. 4,297,334, Cl. 423-321.00R.
McCook, John P.: *See*—
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.
McCracken, Donald G., to Aeroquip Corporation. Rotary joint. 4,296,952, Cl. 285-98.000.
McCreary, James L.: *See*—
Baldwin, Gary L.; and McCreary, James L., 4,297,642, Cl. 330-9.000.
McCreery, James F.: *See*—
Armbrust, William D.; and McCreery, James F., 4,297,058, Cl. 407-113.000.
McCulloch Corporation: *See*—
Luerken, Adolf, 4,296,852, Cl. 192-104.00B.
McCutchan, John C.; and Niven, Rex C., to University of Melbourne, The. Electric fence monitoring system with energizer, responder and receiver. 4,297,633, Cl. 324-51.000.
McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Co. Treatment of silica. 4,297,460, Cl. 526-98.000.
McDonald, Charles J., to Dow Chemical Company, The. Preparation of water-immiscible, acid-soluble N-(aminomethyl)-α,β-ethylenically unsaturated carboxamides, quaternary derivatives and polymers thereof. 4,297,256, Cl. 260-29.4UA.
McDonnell Douglas Corporation: *See*—
Little, Jane; and Greene, Del F., 4,296,677, Cl. 91-510.000.
McGill, Roy F. Turnbuckle. 4,297,046, Cl. 403-46.000.
McGowan, Peter T., to Garrett Corporation, The. Fluid motor-pump unit. 4,297,086, Cl. 417-271.000.
McGrath, Gilbert T.: *See*—
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Meckler, Milton. Modular solar insolation panels. 4,296,740, Cl. 126-448.000.
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Nelson, Robert L.: *See*—
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Nelson, Stephen J., to Upjohn Company, The. 2,3-Dihydro-2,3-dimethyl-7-benzofuryl N-[(phosphinyl)amino]thio- and N-[(phosphinothioyl)amino]thio- methylcarbamates. 4,297,285, Cl. 260-346.730.
Nelson, Walter P.: *See*—
Nelson, Richard L.; and Nelson, Walter P., 4,297,376, Cl. 426-94.000.
Nerod, Irving, to American Can Company. Ultraviolet light apparatus. 4,297,583, Cl. 250-453.000.
Nessi, Aurindo, to Innocenti Santeustacchio S.p.A. Device for inserting and thrusting a bar into a press piercing mill. 4,296,622, Cl. 72-208.000.
Nessler, Hermann: *See*—
Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, 4,297,211, Cl. 210-136.000.
Netzsch, Hermann, to USM Corporation. Process and apparatus for testing arc stud welding guns. 4,297,560, Cl. 219-130.010.
Neumann, Peter, to Sandoz Ltd. Bicyclic heterocyclic amino derivatives. 4,297,490, Cl. 544-55.000.
Nevins, Robert L. Solar collector. 4,296,734, Cl. 126-431.000.
Newell, Harold R., to Mesur-Matic Electronics Corporation. Apparatus for dividing the step angle of a stepping motor. 4,297,625, Cl. 318-696.000.
NGK Insulators, Ltd.: *See*—
Ito, Isao; and Tunashima, Seiichi, 4,297,034, Cl. 356-394.000.
Nguyen, Giao V.: *See*—
Ferree, William I., Jr.; and Nguyen, Giao V., 4,297,260, Cl. 260-29.70H.
Nguyen, Hien V., to Johnson & Johnson. Non-woven fabric comprising buds and bundles connected by highly entangled fibrous areas and methods of manufacturing the same. 4,297,404, Cl. 428-85.000.
Nguyen, Van-Tao: *See*—
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.
Nichol, Thomas J.: *See*—
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,297,136, Cl. 75-206.000.
Nicholas, Terry G., to Wavin B.V. Guttering. 4,297,053, Cl. 405-121.000.
Nicholson, John E.; and Wilmarth, Paul C., to RCA Corporation. Television receiver chassis adapted to be compatible with different tuner and cabinet configurations. 4,297,726, Cl. 358-254.000.
Nick, Howard H. Interplanetary conflict game. 4,296,928, Cl. 273-262.000.
Nickel, Horst, to Bayer Aktiengesellschaft. Pentakis-and heptakis-azoxy dyestuffs. 4,297,278, Cl. 260-143.000.
Nickerson, Harvey R.: *See*—
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, 4,296,804, Cl. 165-133.000.
Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., to United Technologies Corporation. Anode-matrix composite for molten carbonate fuel cell. 4,297,419, Cl. 429-44.000.
Nicol, Klaus: *See*—
Hennig, Ewald M. C.; and Nicol, Klaus, 4,296,754, Cl. 128-694.000.
Nicol, Thomas; Wiley, David; and Allport, Maurice J., to Lucas Industries Limited. Battery charging systems for road vehicles. 4,297,631, Cl. 320-64.000.
Nihon Medi-Physics, Co., Ltd.: *See*—
Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, 4,297,166, Cl. 376-194.000.
Niinuma, Akira, to Alps Electric Co., Ltd. Ganged push button switch having means preventing simultaneous actuation of two push buttons. 4,297,541, Cl. 200-5.00E.
Niiro, Yasuhiko; Furusawa, Kunei; and Okada, Akira, to Kokusai Denshin Denwa Kabushiki Kaisha. Feedthrough for optical fiber. 4,296,996, Cl. 350-96.200.
Nikolayuk, Nicholas, to RCA Corporation. Circularly polarized slotted pylon antenna. 4,297,706, Cl. 343-771.000.
Nilsson, Robert, to Evak Sanitar AB. Non-return valve. 4,296,772, Cl. 137-269.500.
Ninomiya, Hidetaka: *See*—
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.
Nintendo Co., Ltd.: *See*—
Yokoi, Gunpei, 4,296,931, Cl. 273-316.000.
Nippon Electric Co., Ltd.: *See*—
Fujii, Shuzo; and Sato, Yoshikatsu, 4,297,655, Cl. 331-116.00R.
Hayashi, Izuo; and Yonezu, Hiroo, 4,297,652, Cl. 331-94.50H.
Shinmyo, Saburo, 4,297,650, Cl. 331-11.000.
Tanaka, Kouichi; and Amazawa, Kiyoshi, 4,297,645, Cl. 330-280.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Chibana, Masanobu, 4,296,663, Cl. 84-1.010.
Nippon Kogaku K.K.: *See*—
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Ando, Ryo; and Sato, Kazuyoshi, 4,297,119, Cl. 65-141.000.
Nippon Oil Co. Ltd.: *See*—
Sato, Hisatake; Makino, Masaharu; and Hayashi, Hideo, 4,297,450, Cl. 525-333.000.
Nippon Steel Corporation: *See*—
Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, 4,296,919, Cl. 266-111.000.
Nippon Toki Kabushiki Kaisha: *See*—
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.
Nishi, Eijiro: *See*—
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.
Nishikawa, Masaji, to Olympus Optical Company Limited. Electrophotographic process for multiple images. 4,297,423, Cl. 430-54.000.
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel benzamide derivative and method of preparing metoclopramide using same. 4,297,503, Cl. 560-42.000.
Nishimura, Katsuo; and Nanya, Takanori, to Technical Research of Citizen Watch Co., Ltd. Liquid crystal display cell. 4,297,004, Cl. 350-336.000.
Nishino, Takaichi: *See*—
Sakurada, Kenichi; and Nishino, Takaichi, 4,296,965, Cl. 297-284.000.
Nishiyama, Yukinori; and Ichikawa, Hideji, to Sumitomo Electric Industries, Ltd. Disc brake for two-wheeled vehicle. 4,296,843, Cl. 188-73.430.
Nishizawa, Hideaki; and Iguchi, Shin-Ichi, to Sumitomo Electric Industries, Ltd. Multi-photodiodes. 4,297,720, Cl. 357-30.000.
Nishizawa, Jun-Ichi; and Kitsuregawa, Takashi, to Semiconductor Research Foundation Mitsubishi Denki K.K. Vertical type field effect transistor. 4,297,718, Cl. 357-22.000.
Nissan Motor Company, Limited: *See*—
Abo, Toshimi; and Kanegae, Hidetoshi, 4,296,600, Cl. 60-39.28R.
Handa, Noritoshi, 4,296,937, Cl. 277-88.000.
Ichimatsu, Eiji, 4,296,783, Cl. 139-302.000.
Iizuka, Haruhiko; and Sugasawa, Fuzashi, 4,296,724, Cl. 123-568.000.
Ishida, Takashi; and Tanaka, Mamoru, 4,296,907, Cl. 248-573.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,296,651, Cl. 74-869.000.
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,296,944, Cl. 280-804.000.
Nakamura, Ken; Ofuji, Hiromichi; and Yokoyama, Junichi, 4,297,302, Cl. 261-65.000.
Sakurada, Kenichi; and Nishino, Takaichi, 4,296,965, Cl. 297-284.000.
Nisshin Oil Mills, Ltd., The: *See*—
Makino, Akira, 4,297,106, Cl. 23-230.0HC.
Nitschmann, Karl: *See*—
Dirks, Rudolf; and Nitschmann, Karl, 4,296,553, Cl. 30-381.000.
Niven, Rex C.: *See*—
McCutchan, John C.; and Niven, Rex C., 4,297,633, Cl. 324-51.000.
Nixdorf Computer AG: *See*—
Huellwegen, Josef, 4,297,595, Cl. 307-268.000.
Nonomura, Koutaro: *See*—
Kasahara, Nobuyoshi; and Nonomura, Koutaro, 4,297,405, Cl. 428-141.000.
Noonan, John M.: *See*—
Bowman, Wayne A.; Bishop, John F.; and Noonan, John M., 4,297,432, Cl. 430-215.000.
Nooter Corporation: *See*—
Jawad, Maan, 4,296,869, Cl. 220-3.000.
Norbach, Per, to A. B. Carl Munters. Apparatus including throttling device for use in ventilation duct. 4,296,780, Cl. 138-40.000.
Nordblom, George F.: *See*—
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., 4,297,421, Cl. 429-225.000.
Norden, Jurgen; and Ucinhazska, Bruno, to Ruhr-Stickstoff Aktiengesellschaft. Procedure for the careful application of liquids to plants in agricultural stands. 4,296,885, Cl. 239-1.000.
Normann, Richard W.: *See*—
Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., 4,296,985, Cl. 339-48.000.
Normier, Gerard: *See*—
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.
Norsk Hydro a.s: *See*—
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.
North American Philips Corporation: *See*—
Juner, Adolph; and Haas, David J., 4,297,580, Cl. 250-368.000.
North, John W. Process of using and products from fume amorphous silica particulates. 4,297,309, Cl. 264-56.000.
Northern Telecom Limited: *See*—
Dyment, John C.; and Chik, Kiuchi D., 4,297,651, Cl. 331-94.50H.
Webb, Gerald F., 4,297,529, Cl. 179-1.0PC.
Northrop Corporation: *See*—
Koning, Menno G., 4,296,639, Cl. 74-5.460.
Northup, Robert P.; and Anderson, Robert L., to General Electric Company. Ordnance recoil energy control and recovery system. 4,296,670, Cl. 89-43.00R.
Norwood, Donald D.: *See*—
Short, James N.; and Norwood, Donald D., 4,297,445, Cl. 525-52.000.
Nosaka, Soukichi, to Mitsuboshi Belting Ltd. Power transmission V-belt and method of manufacture. 4,296,640, Cl. 474-262.000.
Nottingham, Dennis. Method and H-pile tip for driving piles in permafrost. 4,297,056, Cl. 405-232.000.
Novation, Inc.: *See*—
Kessler, Bayard F., 4,297,530, Cl. 179-2.00C.

Nowotny, Theodor: *See*—
Schlegel, Hans; and Nowotny, Theodor, 4,297,175, Cl. 204-15.000.
Nunciato, David J.; White, Norman H.; and Woodburn, William A., to Union Carbide Corporation. Method for decoking fired heater tubes. 4,297,147, Cl. 134-7.000.
Oberpichler, Gerd; and Honig, Ernst-August, to Volkswagenwerk Aktiengesellschaft. Hydraulic control for an automatic vehicle transmission. 4,296,652, Cl. 74-868.000.
Oberst, E. Ernest, to Marlin Firearms Company, The. Semi-automatic reloading firearm. 4,296,564, Cl. 42-1.00C.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., 4,296,968, Cl. 299-2.000.
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, to Asahi Glass Company, Ltd. Production of alkali metal hydroxide. 4,297,182, Cl. 204-98.000.
Odawara, Youji: *See*—
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,297,216, Cl. 210-613.000.
Oder, Robin R.: *See*—
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,296,809, Cl. 166-259.000.
Oene, Henk V.: *See*—
Chang, Yun-Feng; Oene, Henk V.; and Beckwith, Elaine C., 4,297,448, Cl. 525-162.000.
Oertel, Harald: *See*—
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Offermann, Ludwig; and Wippich, Rheinhold, to Carl Still GmbH & KG, Firma. Immersion-type seal for the standpipe opening of coke ovens. 4,296,938, Cl. 277-135.000.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, 4,297,466, Cl. 526-218.000.
Ofuji, Hiromichi: *See*—
Nakamura, Ken; Ofuji, Hiromichi; and Yokoyama, Junichi, 4,297,302, Cl. 261-65.000.
Ogasawara, Akira: *See*—
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.
Ogasawara, Hiroomi; and Ogasawara, Masaomi. Device for measuring the amount of movement of a straightly moving object. 4,297,634, Cl. 324-61.00R.
Ogasawara, Masaomi: *See*—
Ogasawara, Hiroomi; and Ogasawara, Masaomi, 4,297,634, Cl. 324-61.00R.
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, to Ricoh Company, Ltd. Facsimile apparatus. 4,297,727, Cl. 358-261.000.
Ogle, Robert W., to IMS Limited. Cath-a-jet. 4,296,747, Cl. 128-220.000.
Ohashi, Mochihiko; and Toda, Tosifusa. Concentrating electrophoresis apparatus. 4,297,198, Cl. 204-299.00R.
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Resolution of mercaptopropionic acids. 4,297,282, Cl. 260-326.200.
Ohashi, Yoshinobu: *See*—
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.
Ohdai, Yozo; and Takahata, Yasuyuki, to Asahi-Seiki Manufacturing Co., Ltd. Machines for forming coiled springs. 4,296,621, Cl. 72-130.000.
Ohgushi, Masuhito: *See*—
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.
Ohhira, Hiroshi: *See*—
Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, 4,297,413, Cl. 428-394.000.
Ohta, Ryuji; and Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Coupled shells for vacuum power servo booster. 4,296,680, Cl. 92-98.00D.
Ohta, Sakae: *See*—
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.
Ohta, Tazuo: *See*—
Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, 4,297,507, Cl. 562-416.000.
Ohtake, Yasushi: *See*—
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.
Ohtsuka, Kunio: *See*—
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,296,651, Cl. 74-869.000.
Ohye, Hideo: *See*—
Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, 4,296,948, Cl. 282-27.500.
Oiji, Yoshimasa: *See*—
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, 4,297,369, Cl. 424-285.000.
Okada, Akira: *See*—
Niiro, Yasuhiko; Furusawa, Kahei; and Okada, Akira, 4,296,996, Cl. 350-96.200.
Okada, Kunihiro: *See*—
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.
Okamoto, Masanori: *See*—
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Okano, Hiroshi; and Sato, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Fujikoshi. Lubricated friction speed change gearing. 4,296,648, Cl. 74-798.000.
Okatsuka, Hisahi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cooking apparatus. 4,297,568, Cl. 235-435.000.
OKI Electric Industry Co., Ltd.: *See*—
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, 4,297,647, Cl. 330-307.000.
Okino, Susumu: *See*—
Tatani, Atsushi; and Okino, Susumu, 4,297,332, Cl. 423-240.000.
Okui, Mitsuhiko: *See*—
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, 4,296,597, Cl. 57-205.000.
Okuma Machinery Works, Ltd.: *See*—
Yasuba, Shoichi; and Ito, Takaharu, 4,296,657, Cl. 82-1.00C.
Okumura, Takeshi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.
Okuno, Youichi: *See*—
Yamada, Yasuyuki; and Okuno, Youichi, 4,297,020, Cl. 354-225.000.
Okuyama, Takesi: *See*—
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, 4,296,954, Cl. 285-331.000.
O'Leary, Kevin J.: *See*—
Dotson, Ronald L.; and O'Leary, Kevin J., 4,297,194, Cl. 204-257.000.
Olin Corporation: *See*—
Whitman, Hobart A., III, 4,297,559, Cl. 219-121.0LB.
Oline, James A.: *See*—
Meitzner, Erich F.; and Oline, James A., 4,297,220, Cl. 210-690.000.
Olsen, Thomas O., to Otto Fabric, Inc. Silicone rubber coating material having reduced surface tension. 4,297,265, Cl. 260-33.6SB.
Olshefsky, Frank A. Combination storage and carrying device. 4,296,880, Cl. 294-144.000.
Olsson, Torsten, to AB ASEA-ATOM. Nuclear reactor fuel assembly. 4,297,171, Cl. 376-440.000.
Olympus Optical Company Limited: *See*—
Hijikata, Kazuo, 4,297,199, Cl. 204-299.00R.
Nishikawa, Masaji, 4,297,423, Cl. 430-54.000.
Sato, Eiichi, 4,297,422, Cl. 430-54.000.
O'Meara, David M., to Chicago Bridge & Iron Company. Vacuum attached vibrator apparatus. 4,297,037, Cl. 366-114.000.
Omega Tools International: *See*—
Ormsby, Ronald D., 4,296,822, Cl. 175-249.000.
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, to Hitachi, Ltd.; and Hitachi Metals, Ltd. Gate circuit for a gate turn-off thyristor. 4,297,594, Cl. 307-252.00C.
O'Neal, Thomas D., to American Cyanamid Co. Imidazolinyl benzamides as plant growth regulants. 4,297,126, Cl. 71-78.000.
O'Neil, Jean M., executor: *See*—
O'Neil, John C., deceased, 4,297,057, Cl. 405-303.000.
O'Neil, John C., deceased (by O'Neil, Jean M., executor), to Dresser Industries, Inc. Pivotal roof bolter and extendable rotatable protective canopy for mining machine. 4,297,057, Cl. 405-303.000.
Onishi, Masao: *See*—
Hirao, Tsuneo; and Onishi, Masao, 4,297,609, Cl. 310-339.000.
Ono, Hisatake: *See*—
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 4,297,470, Cl. 526-304.000.
Ono, Yoshio: *See*—
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.
Onoda Cement Co., Ltd.: *See*—
Misaki, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, 4,296,864, Cl. 209-144.000.
Onuma, Eiichi: *See*—
Misaka, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, 4,296,864, Cl. 209-144.000.
Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,297,360, Cl. 424-263.000.
Orlandi, Robert G., to S.A. PRB Societe Anonyme. Electric circuit for firing a detonator. 4,296,688, Cl. 102-218.000.
Ormsby, Ronald D., to Omega Tools International. Multipurpose fluid flow assisted downhole tool. 4,296,822, Cl. 175-249.000.
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Image forming process. 4,297,470, Cl. 526-304.000.
Osakasanko Kabushiki Kaisha: *See*—
Nagano, Kenji, 4,296,534, Cl. 24-270.000.
Osegowitsch, Viktor: *See*—
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.
Osellame, Mirko: *See*—
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.
Oshio, Hiromichi: *See*—
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.

Oswald, Hendrikus J.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,296,535, Cl. 28-257.000.
Otani, Masaru: *See*—
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.
Otis Elevator Company: *See*—
Martin, Anthony N., 4,296,601, Cl. 60-224.000.
Otis Engineering Corporation: *See*—
Taylor, Donald F.; and Bostock, James H., 4,296,806, Cl. 166-120.000.
Otsuka, Yasuhiro: *See*—
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.
Ott, Karl-Heinz: *See*—
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Otto Fabric, Inc.: *See*—
Olsen, Thomas O., 4,297,265, Cl. 260-33.6SB.
Outokumpu Oy: *See*—
Uusitalo, Leo; and Tuominen, Pertti, 4,297,067, Cl. 414-114.000.
Owen, R. Calvin, Jr., to Polaroid Corporation. Optical apparatus and method for changing a zoom camera to a fixed focus camera. 4,297,007, Cl. 350-432.000.
Oy Helvar: *See*—
Lampinen, Esko; and Kajavo, Kari, 4,296,545, Cl. 29-602.00R.
Oyobe, Isao: *See*—
Takeguchi, Masanobu; and Oyobe, Isao, 4,297,222, Cl. 210-748.000.
Ozawa, Kanji: *See*—
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.
P C U K Produits Chimiques Ugine Kuhlmann: *See*—
Delavarenne, Serge Y.; Dubreux, Bernard; and Tellier, Pierre, 4,297,288, Cl. 260-378.000.
Paaren, Herbert E.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., 4,297,289, Cl. 260-397.200.
Pacer Systems, Inc.: *See*—
Green, David L., 4,297,673, Cl. 340-27.0NA.
Pacer Technology and Resources, Inc.: *See*—
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., to United States of America, Air Force. Unsymmetrical diphosphatetraazacyclooctatetraenes. 4,297,510, Cl. 564-13.000.
Padgett, Henry A., Sr. Oil filter unit. 4,297,212, Cl. 210-168.000.
Page, Donald F.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,297,360, Cl. 424-263.000.
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., to Xerox Corporation. Imaging member. 4,297,425, Cl. 430-58.000.
Paisley, Robert J., to Corning Glass Works. Ceramic foam cement. 4,297,140, Cl. 428-310.000.
Pajevic, Paul D. Shoe with sole cushioning assembly. 4,296,557, Cl. 36-7.800.
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., to Chesebrough-Pond's Inc. Hair waving and straightening method. 4,296,764, Cl. 132-7.000.
Palm, Peter: *See*—
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.
Palmgren, Odd E.: *See*—
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.
Palumbo, Pasquale M. Dynamic patellar brace. 4,296,744, Cl. 128-80.00C.
Pan, Jing-Jong, to Harris Corporation. Plural frequency oscillator employing multiple fiber-optic delay line. 4,297,656, Cl. 331-135.000.
Panametrics, Inc.: *See*—
Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., 4,297,607, Cl. 310-334.000.
Panasenko, Nikolai N.: *See*—
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbelisev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.
Papalos, John G.; and Kavchok, Ronald W., to Diamond Shamrock Corporation. Synthetic polymer emulsifier. 4,297,259, Cl. 260-29.6NR.
Parker, Louis W.: *See*—
Hedges, Rhey W., 4,297,628, Cl. 318-798.000.
Parr, David, to David Parr & Associates Limited. Heated window structure with an electrical connector assembly. 4,297,565, Cl. 219-522.000.
Parsons, Robert, to Texas Instruments Incorporated. Apparatus for displaying graphics symbols. 4,297,693, Cl. 340-744.000.
Passarotti, Carlo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.
Patch, Dana R.: *See*—
Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., 4,297,607, Cl. 310-334.000.
Pate, Jerry W., to E-Systems, Inc. Input gain adjusting apparatus and method. 4,297,527, Cl. 179-1.0VC.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,297,453, Cl. 525-408.000.
Patil, Balaji V.; and Tommaney, Joseph W., to Allegheny Ludlum Steel Corporation. Electroslag remelting method and flux composition. 4,297,132, Cl. 75-10.00V.
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D. Doughnut-type transformer for resistance butt welding. 4,297,665, Cl. 336-60.000.
Patterson, Theodore P.; and Winner, Stephen E., to Patterson, Theodore P. Blister preventing foot cover. 4,296,499, Cl. 2-239.000.
Pauling, Horst: *See*—
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,296,801, Cl. 165-104.170.
Paulus, Philippe, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Manufacturing coated steel strip. 4,297,398, Cl. 427-320.000.
Pauwels, Michael A.; and Poot, Abraham L., to Pneumo Corporation. 360 Degree linear variable phase transformer. 4,297,698, Cl. 340-870.320.
Pavlik, Kathleen W. Pocket secretary or the like. 4,296,945, Cl. 281-1.000.
Payne, Richard J. Tractor pull sled. 4,296,840, Cl. 188-8.000.
Pazmany, Ladislao, to General Dynamics Corporation. Fin erection mechanism. 4,296,895, Cl. 244-3.290.
Peacock, Richard C. Method of installing underground pipe. 4,297,055, Cl. 405-184.000.
Pearson, Thomas J., Jr. Noise obviating electronic signal coupling means. 4,297,643, Cl. 330-178.000.
Pedersen, Jorgen R., to Danavox A/S. Hook-shaped part of a behind-the-ear hearing aid. 4,296,829, Cl. 181-129.000.
Pellegrino, Luigi. Automatic torque regulator. 4,296,849, Cl. 192-61.000.
Peller, Robert C.; and Dyer, Jack E., to General Dynamics Corporation. Structurally damped bolt. 4,296,839, Cl. 188-378.000.
Pelz, Willibald: *See*—
Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, 4,297,438, Cl. 430-377.000.
Pennise, Robert J.: *See*—
Stoute, Neville, Sr.; and Pennise, Robert J., 4,296,506, Cl. 4-480.000.
Pereman, Gordon F.: *See*—
Kellar, John D.; and Pereman, Gordon F., 4,297,118, Cl. 65-104.000.
Permelec Electrode Ltd.: *See*—
Sato, Hideo; and Shimamune, Takayuki, 4,297,195, Cl. 204-290.00F.
Perrott, Francis C. Transportation systems. 4,296,901, Cl. 246-167.00R.
Persson, Lennart P. E.: *See*—
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,296,633, Cl. 73-362.0AR.
Perz, John S., to Martin Marietta Corporation. Method for curing concrete. 4,297,399, Cl. 427-385.500.
Peterman, Robert J.: *See*—
Balbach, George C.; and Peterman, Robert J., 4,296,570, Cl. 49-360.000.
Peterson, Eugene W.: *See*—
Wurtz, Howard P.; and Peterson, Eugene W., 4,297,082, Cl. 417-51.000.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,297,484, Cl. 528-423.000.
Peyssard, Guy: *See*—
Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy, 4,296,791, Cl. 160-206.000.
Pfaff Industriemaschinen GmbH: *See*—
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, 4,296,697, Cl. 112-109.000.
Jehle, Fritz; and Willenbacher, Erich, 4,296,700, Cl. 112-153.000.
Pfeifer, Josef; and Reinehr, Dieter, to Giba-Geigy Corporation. Transparent polyamide from branched chain C_{11} diamine. 4,297,480, Cl. 528-346.000.
Pfister, Hans B.: *See*—
Baltensperger, Rudolf; and Pfister, Hans B., 4,296,690, Cl. 104-91.000.
Phillips Petroleum Co.: *See*—
Cowan, Kiplin D., 4,297,506, Cl. 560-246.000.
Johnson, Paul H., 4,296,800, Cl. 165-95.000.
Layton, James E., 4,297,745, Cl. 367-66.000.
McDaniel, Max P.; and Welch, Melvin B., 4,297,460, Cl. 526-98.000.
Morris, Charles W.; and Terry, Ronald E., 4,296,811, Cl. 166-273.000.
Short, James N.; and Norwood, Donald D., 4,297,445, Cl. 525-52.000.
Trepka, William J., 4,297,464, Cl. 526-181.000.
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,297,451, Cl. 525-366.000.
Phillips, Raymond M. Anti-surge flotation mattress. 4,296,510, Cl. 5-450.000.
Phillips, Thomas R., to Du Pont de Nemours, E. I., and Company. Polyvinyl butyral plasticized with tetraethyleneglycol di-n-heptanoate. 4,297,262, Cl. 260-31.600.

Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., to International Nickel Co., Inc., The. High strength aluminum alloy and process. 4,297,136, Cl. 75-206.000.

Pierce, William C., to Pitts Industries, Inc. Drive hub with curved springs and drive keys for electro-magnetic clutch. 4,296,851, Cl. 192-84.00C.

Pierre Fabre S.A.: *See—*
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.

Pietsch, Herbert E.: *See—*
Gupta, Tapan K.; and Pietsch, Herbert E., 4,297,250, Cl. 252-518.000.

Pillsbury Company, The: *See—*
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Pinel, Anne-Marie: *See—*
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.

Pioneer Electronic Corporation: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.

Pitts Industries, Inc.: *See—*
Pierce, William C., 4,296,851, Cl. 192-84.00C.

Place, Donald E., to Therm-O-Disc, Incorporated. Thermostat with bracket for attachment to a tubular member. 4,297,668, Cl. 337-365.000.

Plastics Engineering Company: *See—*
Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased, 4,297,467, Cl. 526-259.000.

Platt, John R., to Illinois Tool Works Inc. Two-way container package. 4,296,858, Cl. 206-150.000.

Plessey Handel und Investments AG: *See—*
Mead, John F., 4,296,999, Cl. 350-96.210.

Plessey Peripheral Systems: *See—*
Dargatz, Dayton O., 4,297,043, Cl. 400-224.000.

Pneumo Corporation: *See—*
Pauwels, Michael A.; and Poot, Abraham L., 4,297,698, Cl. 340-870.320.

Pochan, Darlyn F.: *See—*
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., 4,297,425, Cl. 430-58.000.

Pochan, John M.: *See—*
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., 4,297,425, Cl. 430-58.000.

Podbeltsev, Viktor I.: *See—*
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.

Poff, David A.: *See—*
Hill, Michael S.; and Poff, David A., 4,296,546, Cl. 29-730.000.

Pohl, Ludwig: *See—*
Eidenschink, Rudolf; and Pohl, Ludwig, 4,297,515, Cl. 568-329.000.

Polaroid Corporation: *See—*
Farmer, Zane M., 4,297,017, Cl. 354-34.000.
Johnson, Bruce K.; and Whiteside, George D., 4,297,016, Cl. 354-27.000.
Owen, R. Calvin, Jr., 4,297,007, Cl. 350-432.000.
Sullivan, Charles I., 4,297,431, Cl. 430-215.000.

Polhemus, Barry: *See—*
Denning, Richard; Spak, Mark A.; and Polhemus, Barry, 4,297,393, Cl. 427-88.000.

Polk, Donald E.: *See—*
Giessen, Bill C.; Polk, Donald E.; and Ray, Ranjan, 4,297,135, Cl. 75-123.00B.

Polymer Research Corp. of America: *See—*
Horowitz, Carl; and Dichter, Michael, 4,297,108, Cl. 44-1.0SR.

Pommer, Ernst-Heinrich: *See—*
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.

Pontifex, Edward J., to Fine, Louis B., a part interest. Colostomy appliance. 4,296,749, Cl. 128-283.000.

Pook, Karl-Heinz: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., 4,297,354, Cl. 424-248.510.

Poot, Abraham L.: *See—*
Pauwels, Michael A.; and Poot, Abraham L., 4,297,698, Cl. 340-870.320.

Popplewell, Frank W., to Dunlop Limited. Method of manufacturing games rackets. 4,297,308, Cl. 264-46.600.

Porter, James A., Jr.: *See—*
Thigpen, Ben B.; and Porter, James A., Jr., 4,296,827, Cl. 181-107.000.

Posso, Patrick. Process for the simplified packing of a magnetic tape for computer and winding core for carrying out this process. 4,296,890, Cl. 242-71.800.

Potter, George R., to Burley Industries, Inc. Method for sealing a dryer. 4,296,540, Cl. 29-460.000.

Powell, Charles R. Building scaffold support. 4,296,905, Cl. 248-237.000.

PPG Industries, Inc.: *See—*
Crawford, Roger A.; and Simmons, Robert B., 4,297,333, Cl. 423-241.000.
Jozwiak, Edward L., Jr., 4,297,261, Cl. 260-29.7RP.
Kellar, John D.; and Pereman, Gordon F., 4,297,118, Cl. 65-104.000.
Leatherman, Ivan R., 4,297,267, Cl. 260-42.530.

PQ Corporation: *See—*
Thomas, Jeffrey R., 4,297,163, Cl. 159-48.00R.

Pratt & Lambert, Inc.: *See—*
Wolinski, Leon E.; and Berezuk, Peter D., 4,297,158, Cl. 156-305.000.

Pratt, Paul D.: *See—*
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Presco, Inc.: *See—*
Gotman, Alexander, 4,296,542, Cl. 29-574.000.

Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, to Resistoflex Corporation. Corrosion resistant heat exchanger element and method of manufacture. 4,296,804, Cl. 165-133.000.

Preston, Mark D. Methods and apparatus for conditioning plywood veneer with high frequency radio energy. 4,296,555, Cl. 34-1.000.

Pretzer, Wayne R.: *See—*
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,297,518, Cl. 568-385.000.

Preuss, Bernhard: *See—*
Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, 4,297,664, Cl. 335-176.000.

Price, Ernest H. Method of producing oil from a formation fluid containing both oil and water. 4,296,810, Cl. 166-265.000.

Price, Frank C.: *See—*
Halford, David W.; Price, Frank C.; and Bosworth, George H., 4,296,513, Cl. 12-12.000.

Price, Robert B., to Jacobs Manufacturing Company, The. Compression relief retarders for supercharged internal combustion engines. 4,296,605, Cl. 60-599.000.

Priepke, Edward H.: *See—*
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., 4,296,591, Cl. 56-10.300.

Priesemuth, Wolfgang. Pneumatically operating delay switches. 4,297,544, Cl. 200-34.000.

Priest, Clayton W.; and Solomon, Edward T., to Priest, Clayton W. Hair conditioner. 4,296,763, Cl. 132-7.000.

Procter & Gamble Company, The: *See—*
Bernardino, Lowell W., 4,297,251, Cl. 252-545.000.
Logan, Ted J.; and Lubsen, Timothy A., 4,297,292, Cl. 260-428.500.
Rasser, Jacobus C., 4,297,230, Cl. 252-117.000.

Proteus Corporation: *See—*
Inhofer, Harold G., 4,296,672, Cl. 91-271.000.

Proud, Norman. Screen panel. 4,296,579, Cl. 52-239.000.

Przybyla, Franciszek J.; and Rossler, Eleanor J., to Duracell International Inc. Method of treating silver oxide powder and the product formed therefrom. 4,297,249, Cl. 252-518.000.

Puch, Diethelm; and Will, Norbert F., to Triumph-Werke Nurnberg A.G. Method and apparatus for positioning a type disc in a balanced force system. 4,297,040, Cl. 400-144.200.

Puschmann, Werner, to AGFA-Gevaert Aktiengesellschaft. System for the detection of splicing defects in film. 4,297,585, Cl. 250-560.000.

Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Harmut, to Schering Aktiengesellschaft. Thiazolylidene-oxo-propionitriles, insecticidal composition containing these compounds. 4,297,361, Cl. 424-263.000.

Quan, Ronald, to Ampex Corporation. Quasi feedback horizontal scan linearization for cathode ray tubes. 4,297,620, Cl. 315-389.000.

Quanbeck, Sherman H., to Wil-Rich, Inc. Seeding device with air distribution system. 4,296,695, Cl. 111-34.000.

Quick, Leonard M.: *See—*
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,297,242, Cl. 252-439.000.

Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., to Rockwell International Corporation. Method and apparatus for holographic processing. 4,296,994, Cl. 350-3.730.

Quinlan, Patrick M., to Petrolite Corporation. Quaternized derivatives of polymerized pyridines and quinolines. 4,297,484, Cl. 528-423.000.

Quintana, Pedro. Dust removing attachment device for automatic air files. 4,296,572, Cl. 51-170.0TL.

Rabian, Jean: *See—*
Nard, Georges; Rabian, Jean; and Rouaud, Michel, 4,297,700, Cl. 343-6.50R.

Raible, Donald A., to Bentley Laboratories, Inc. Blood oxygenator. 4,297,318, Cl. 422-46.000.

Rajappa, Srinivasachari; and Sudarsanam, Vasudevan, to Ciba-Geigy Corporation. Benzimidazoles and pharmaceutical preparations containing such compounds. 4,297,365, Cl. 424-270.000.

Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, to E. C. H. Will (GmbH & Co.). Paper sheet layer forming and transferring arrangement. 4,297,066, Cl. 414-43.000.

Ranford, Alan B.: *See—*
Joslin, Joel A.; and Ranford, Alan B., 4,296,759, Cl. 128-766.000.

Rankin, William J. Bank erosion control units. 4,297,052, Cl. 405-16.000.

Rasberger, Michael; Rosenberger, Siegfried; and Evans, Samuel, to Ciba-Geigy Corporation. Phenolic-1,3,5-triazines. 4,297,492, Cl. 544-211.000.

Rasp, Christian: *See—*
Becker, Robert; Grolig, Johann; and Rasp, Christian, 4,297,501, Cl. 560-24.000.

Rasser, Jacobus C., to Procter & Gamble Company, The. Non-crystallizing transparent soap bars. 4,297,230, Cl. 252-117.000.

Rathmell, William G.: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Rau, Karl: *See—*
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Ray, Ranjan: *See—*
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Raychem Corporation: *See—*
Jervis, James E., 4,297,155, Cl. 156-86.000.
Martin, Charles L., 4,296,955, Cl. 285-381.000.

Raymond, A.: *See—*
Muller, Klaus; and Mack, Gerhard, 4,296,530, Cl. 24-295.000.

Raymond, Christopher D., to G. D. Searle & Co. Surgical sealant composition. 4,296,745, Cl. 128-156.000.

Raytheon Company: *See—*
Carnes, Irven S., 4,297,702, Cl. 343-7.0PF.

RCA Corporation: *See—*
Ahmed, Adel A. A., 4,297,644, Cl. 330-264.000.
Carroll, Charles B.; and Scheible, Howard G., 4,297,312, Cl. 264-134.000.
Denning, Richard; Spak, Mark A.; and Polhemus, Barry, 4,297,393, Cl. 427-88.000.
Hsu, Sheng T., 4,297,719, Cl. 357-23.000.
Koons, Patrick R.; and Neilson, John M. S., 4,297,149, Cl. 148-1.500.
Nicholson, John E.; and Wilmarth, Paul C., 4,297,726, Cl. 358-254.000.
Nikolayuk, Nicholas, 4,297,706, Cl. 343-771.000.
Silcox, David R.; and Doster, John L., 4,297,095, Cl. 432-59.000.
Sterzer, Fred, 4,297,641, Cl. 328-15.000.

Reagent Chemical and Research, Inc.: *See—*
Hicke, David W., 4,296,536, Cl. 29-1.300.

Redon Trust: *See—*
Marer, Joseph, 4,296,686, Cl. 102-427.00.

Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., to John Zink Company. Free-floating combustion chamber and stack. 4,297,094, Cl. 431-202.000.

Reed, Ronald R.; Crone, William F., Jr.; and Meyer, G. Robert, to Libbey-Owens-Ford Company. Method of and apparatus for cutting sheets of glass. 4,296,662, Cl. 83-880.000.

Rehnberg, Leif E. L.: *See—*
Lundgren, Sune I.; and Rehnberg, Leif E. L., 4,296,653, Cl. 81-3.46R.

Reichhold Limited: *See—*
De Ruiter, Robert S.; and Kambanis, Stamatis M., 4,297,264, Cl. 260-33.40R.

Reider, Samuel B., to General Motors Corporation. Porous laminated material. 4,296,606, Cl. 60-754.000.

Reinehr, Dieter: *See—*
Pfeifer, Josef; and Reinehr, Dieter, 4,297,480, Cl. 528-346.000.

Reineke, Charles E.: *See—*
Nelson, Linnea E.; and Reineke, Charles E., 4,297,475, Cl. 528-271.000.

Reischl, Artur; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for working up isocyanate distillation residues. 4,297,456, Cl. 525-452.000.

Reissenweber, Gernot; and Mangold, Dietrich, to BASF Aktiengesellschaft. Preparation of 2,3-dioxo-1,4-benzoxazine derivatives. 4,297,491, Cl. 544-105.000.

Reissmann, Klaus: *See—*
Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, 4,297,066, Cl. 414-43.000.

Relles, Howard M.: *See—*
Williams, Frank J., III; and Relles, Howard M., 4,297,474, Cl. 528-170.000.

Rentzea, Costin: *See—*
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.

REPA Feinstanzwerk GmbH: *See—*
Schmid, Johann, 4,296,525, Cl. 16-174.000.

Resistoflex Corporation: *See—*
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, 4,296,804, Cl. 165-133.000.

Reynolds, Daniel J.: *See—*
Rice, Hoyt G., Jr.; and Reynolds, Daniel J., 4,296,576, Cl. 52-90.000.

Rheinmetall GmbH: *See—*
Romer, Rudolf; and Schepp, Hans-Egon, 4,296,685, Cl. 102-387.000.

Rhone Poulenc Agrochemie: *See—*
Guigues, Francois; and Trinh, Stephane, 4,297,367, Cl. 424-283.000.

Rhone-Poulenc Agrochimie: *See—*
Michelet, Daniel, 4,297,284, Cl. 260-346.220.

Rhone-Poulenc Industries: *See—*
Costantini, Michel; and Jouffret, Michel, 4,297,287, Cl. 260-348.160.

Rhone-Poulenc-Textile: *See—*
Achard, Georges; Chion, Pierre; and Menault, Jacques, 4,297,412, Cl. 428-370.000.
Rochina, Vincent; and Sacco, Jean, 4,297,478, Cl. 528-336.000.
Rochina, Vincent; and Sacco, Jean, 4,297,479, Cl. 528-336.000.

Rhonehouse, Donald E., to TGS Systems, Inc. Glass tempering furnaces and systems. 4,297,121, Cl. 65-348.000.

Rice, Doris M.: *See—*
Gilbert, Richard J.; and Rice, Doris M., 4,297,444, Cl. 521-160.000.

Rice, Hoyt G., Jr.; and Reynolds, Daniel J., to Anaconda Company, The. Sloped wall structure and anchor clip. 4,296,576, Cl. 52-90.000.

Rice, Robert A., to Eaton Corporation. Freeze drain valve. 4,296,770, Cl. 137-62.000.

Richard, Henry J.: *See—*
Gidge, Kenneth N.; and Richard, Henry J., 4,296,792, Cl. 160-332.000.

Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, to BASF Aktiengesellschaft. Manufacture of 4-amino-5-chloro-1-phenylpyridaz-6-one using aqueous phenol-4-sulfonic acid. 4,297,493, Cl. 544-241.000.

Richway Industries Ltd.: *See—*
Borglum, Richard P., 4,296,875, Cl. 222-617.000.

Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., to Occidental Oil Shale, Inc. In situ oil shale retort having horizontally offset pillars. 4,296,968, Cl. 299-2.000.

Ricoh Company, Ltd.: *See—*
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.
Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, 4,297,426, Cl. 430-59.000.
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.

Riedel-de Haen Aktiengesellschaft: *See—*
Franz, Karl; and Schonfeld, Bernd, 4,297,390, Cl. 427-64.000.

Riege, Ulrich: *See—*
Scheffler, Knut; and Riege, Ulrich, 4,297,304, Cl. 264-0.500.

Rieger, Ulrich: *See—*
Schnabele, Werner; Buckley, Jack; and Rieger, Ulrich, 4,296,894, Cl. 244-3.270.

Riemenschneider, Wilhelm: *See—*
Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, 4,297,323, Cl. 422-208.000.

Ring Lock Container S. A.: *See—*
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Rink, Helm: *See—*
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, 4,296,804, Cl. 165-133.000.

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Rio, Michel: *See—*
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Rips, Richard; and Morier, Elisabeth, to Institut National de la Sante et de la Recherche Medicale. Pseudopeptides used as medicaments. 4,297,346, Cl. 424-177.000.

Rishel, John W.: *See—*
DeVisser, Richard B.; Rishel, John W.; and Kuiper, Joe A., 4,297,209, Cl. 210-107.000.

Ritscher, James S.; and Sandner, Michael R., to Union Carbide Corporation. Three-way catalytic process for gaseous streams. 4,297,328, Cl. 423-213.200.

Rittersdorf, Walter: *See—*
Guthlein, Werner; Wielinger, Hans; Rittersdorf, Walter; and Werner, Wolfgang, 4,297,271, Cl. 260-107.000.

Ritze, Willy, to Jenaer Glaswerk, Schott & Gen. Optical colored and filter glass. 4,297,142, Cl. 501-77.000.

Rivenbark, Morrison, to Smith, Douglas R. Method and apparatus for forming a chlorine-water solution and for utilizing the same to disinfect water lines and the like. 4,297,223, Cl. 210-754.000.

Robert Bosch GmbH: *See—*
Hofmann, Karl, 4,296,887, Cl. 239-397.500.
Schlagmuller, Walter, 4,296,717, Cl. 123-195.00A.
Schmidt, Waldemar, 4,297,314, Cl. 264-320.000.
Werner, Peter; Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, 4,297,599, Cl. 307-355.000.

Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., to Goodyear Tire & Rubber Company, The. Tread for pneumatic tire. 4,296,789, Cl. 152-209.00R.

Roberts, James K., to Bendix Corporation, The. Anchor plate for a drum brake assembly. 4,296,845, Cl. 188-341.000.

Roberts, Ralph R. Vandal alarm system for parking meters. 4,297,683, Cl. 340-539.000.

Robertshaw Controls Company: *See—*
Lewis, Jay L., 4,296,795, Cl. 165-27.000.
Manecke, Siegfried E.; and Buckshaw, Thomas M., 4,296,603, Cl. 60-528.000.
Steele, Everett T., Jr., 4,296,721, Cl. 123-407.000.
Tyler, Hugh J.; and Conway, William H., 4,297,557, Cl. 219-10.55R.

Robertson, Kenneth L.; and Heslep, Curtis A., to Ken-Koat, Inc. Apparatus for coating metal substrates with adhesive. 4,296,708, Cl. 118-233.000.

Robinet, Jules P.: *See—*
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,296,870, Cl. 220-3.300.

Robinson, Jesse L. Deformable highway marker. 4,297,051, Cl. 404-11.000.

Robinson, John W.: *See—*
Wilcox, Brian N.; and Robinson, John W., 4,296,666, Cl. 84-1.260.

Rochina, Vincent; and Sacco, Jean, to Rhone-Poulenc-Textile. Process for the discontinuous production of aromatic in mixture of polyamides calcium chloride and N-methylpyrrolidone-2. 4,297,478, Cl. 528-336.000.

Rochina, Vincent; and Sacco, Jean, to Rhone-Poulenc-Textile. Process for the continuous production of aromatic polyamides in a mixture of calcium chloride and N-methylpyrrolidone-2. 4,297,479, Cl. 528-336.000.

Rockwell International Corporation: *See*—
Frerking, Marvin E., 4,297,657, Cl. 331-176.000.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,296,994, Cl. 350-3.730.
Smith, Elroy C., Jr.; and Yao, Shi K., 4,297,189, Cl. 204-192.0SP.

Rodemer, Karl, to Lincoln-Helios GmbH. Multiple coupling for lubricating systems. 4,296,777, Cl. 137-351.000.

Rodenbeck, Philip G.; and Koenig, Fredrick, to General Electric Company. Wire vibration damping device and method for coil winding apparatus. 4,296,784, Cl. 140-92.200.

Rodgers, John M. Photo-electric digital circuit for monitoring strip loop position. 4,297,586, Cl. 250-561.000.

Rodionov, Evgeny I.: *See*—
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A., 4,297,589, Cl. 290-40.00R.

Roesler, Helmut; and Muehlbauer, Otto, to Siemens Aktiengesellschaft. Electronic counter for electrical digital pulses. 4,297,591, Cl. 307-224.00C.

Rogers, Stanley J. C.; and Taplin, John F., to Vickers Limited. Edge joint for sheets. 4,296,983, Cl. 312-263.000.

Rohm and Haas Company: *See*—
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,297,342, Cl. 424-84.000.
Meitzner, Erich F.; and Oline, James A., 4,297,220, Cl. 210-690.000.

Rojahn, Bernd: *See*—
Meier, Willi; and Rojahn, Bernd, 4,296,702, Cl. 112-258.000.

Rollei of America, Inc.: *See*—
Adams, James R., Jr., 4,297,011, Cl. 354-23.00D.

Rolls-Royce Motors Limited: *See*—
Thornton, Kenneth, 4,296,646, Cl. 74-688.000.

Roman, Alain: *See*—
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.

Roman, Stephan: *See*—
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Rombusch, Konrad: *See*—
Maahs, Gunther; and Rombusch, Konrad, 4,297,505, Cl. 560-219.000.

Romer, Rudolf; and Schepp, Hans-Egon, to Rheinmetall GmbH. Warhead with slave missiles disposed in a firing tube. 4,296,685, Cl. 102-387.000.

Ronk Electrical Industries, Inc.: *See*—
Ronk, Leroy B., 4,297,551, Cl. 200-67.00B.

Ronk, Leroy B., to Ronk Electrical Industries, Inc. Electrical transfer switch. 4,297,551, Cl. 200-67.00B.

Ronne, Reuben N.: *See*—
Blanchard, Kenneth G.; and Ronne, Reuben N., 4,296,963, Cl. 297-170.000.

Roos, Leo: *See*—
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Rosenbaum, Murray: *See*—
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, 4,297,570, Cl. 235-493.000.

Rosenberger, Siegfried: *See*—
Rasberger, Michael; Rosenberger, Siegfried; and Evans, Samuel, 4,297,492, Cl. 544-211.000.

Rosheim, Mark E. Fluid driven servomechanism. 4,296,681, Cl. 92-122.000.

Ross, Byron W. Engraving machine. 4,297,060, Cl. 409-86.000.

Ross, Jim; and Vilicich, John. Collapsible charcoal lighting holder. 4,296,726, Cl. 126-25.00B.

Ross, Jury N.: *See*—
Yasinsky, Konstantin K.; Glazunov, Sergei G.; Ross, Jury N.; and Bykov, Igor D., 4,296,793, Cl. 164-24.000.

Ross, Leon I., to Caribbean Properties Limited. Process and apparatus for the contact and separation of immiscible fluids. 4,297,111, Cl. 55-92.000.

Rossander, Bror L. E.; Ermebrant, Lennart C.; and Lesser, Martin, to Fagersta A.B. Product provided with sound damping element. 4,296,830, Cl. 181-208.000.

Rossi, Alberto: *See*—
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256 000.

Rossler, Eleanor J.: *See*—
Przybyla, Franciszek J.; and Rossler, Eleanor J., 4,297,249, Cl. 252-518.000.

Rothbuhr, Lothar: *See*—
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, 4,297,145, Cl. 106-308.00Q.

Rouaud, Michel: *See*—
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Rourke, James E.: *See*—
Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., 4,297,419, Cl. 429-44.000.

Roussel Uclaf: *See*—
Heymes, Rene; and Lutz, Andre, 4,297,352, Cl. 424-246.000.

Roux, Marc, to Alsthom-Atlantique. Railway car ceiling panel. 4,296,692, Cl. 105-397.000.

Rowe International, Inc.: *See*—
Mitchell, Robert P.; and Scalera, Frank T., 4,296,872, Cl. 221-195.000.

Ruben, Samuel. Glycol-iodine composition and method of preparation. 4,297,232, Cl. 252-187.00R.

Rubottom, Nolan R.; and Fine, Jerry W. Supplemental right turn signal for semitrailers. 4,297,675, Cl. 340-107.000.

Rueth, William R., Jr., to G & W Electric Specialty Company. Time delay switch mechanism. 4,297,554, Cl. 200-153.0SC.

Ruhr-Stickstoff Aktiengesellschaft: *See*—
Norden, Jurgen; and Ucinhazska, Bruno, 4,296,885, Cl. 239-1.000.

Ruip, Terrence M.: *See*—
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Rush-Hampton Industries, Inc.: *See*—
Frazier, Stephen E., 4,297,348, Cl. 424-180.000.

Ruyak, Robert F., to Autoclave Engineers, Inc. Magnetically actuated metering valve. 4,296,912, Cl. 251-65.000.

Sabatino, David B. Cutting and splitting tool. 4,296,552, Cl. 30-183.000.

Sacco, Jean: *See*—
Rochina, Vincent; and Sacco, Jean, 4,297,478, Cl. 528-336.000.
Rochina, Vincent; and Sacco, Jean, 4,297,479, Cl. 528-336.000.

Sachetto, Jean-Pierre; and Cuccolo, Sergio, to Centre National pour l'Exploitation des Oceans. Anti-fouling paint. 4,297,137, Cl. 106-15.050.

Sachs, Wolfgang: *See*—
Taddicken, Hermann; and Sachs, Wolfgang, 4,296,696, Cl. 112-70.000.

Sada, Kenzo; and Hayashi, Shigeyuki, to Kubota, Ltd. Casing for a transmission. 4,296,644, Cl. 74-606.00R.

Saegusa, Takeo: *See*—
Goto, Jugo; and Saegusa, Takeo, 4,297,449, Cl. 525-329.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See*—
Godard, Pierre; and Billot, Michel, 4,297,629, Cl. 320-7.000.

Sagae, Masayuki: *See*—
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St. Clair, Richard C.: *See*—
Dittman, Charles C.; and St. Clair, Richard C., 4,297,622, Cl. 318-254.000.

St. Joseph Bank and Trust Company, executor: *See*—
Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased, 4,297,467, Cl. 526-259.000.

Saitoh, Yuichi: *See*—
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.

Sakai Chemical Industry Co., Ltd.: *See*—
Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, 4,297,248, Cl. 252-477.00R.

Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, to Ricoh Co., Ltd. Electrophotographic element with carbazole hydrazone or anile charge transport compounds. 4,297,426, Cl. 430-59.000.

Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, to Bridgestone Tire Company Limited. Light tire bodies using thick cords. 4,296,790, Cl. 152-354.00R.

Sakamoto, Seiya: *See*—
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.

Sakharnov, Vasily A.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Sakurada, Kenichi; and Nishino, Takaichi, to Nissan Motor Company, Limited; and Tachikawa Spring Company, Limited. Seat with adjustable lumbar supporter. 4,296,965, Cl. 297-284.000.

Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, to Nippon Steel Corporation. Apparatus for continuously producing a high strength dual-phase steel strip or sheet. 4,296,919, Cl. 266-111.000.

Saleck, Wilhelm: *See*—
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Salman, Syed, to International Telephone and Telegraph Corp. Electroplating rack. 4,297,197, Cl. 204-297.00W.

Sanborn, George A. Traveling light display. 4,296,562, Cl. 40-438.000.

Sanderson, Hendrik J., to U.S. Philips Corporation. Method of controlling the position of a write or read head and a device for carrying out the method. 4,297,733, Cl. 360-77.000.

Sandner, Michael R.: *See*—
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Sandoz, Inc.: *See*—
Barcza, Sandor, 4,297,349, Cl. 424-184.000.
Maulding, Hawkins V., 4,297,353, Cl. 424-247.000.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter, 4,297,296, Cl. 260-459.00A.
Neumann, Peter, 4,297,490, Cl. 544-55.000.

Sandrock, Klaus; and Cordes, Gunter, to Sanol Schwarz-Monhein GmbH. Process for selectively producing isosorbide-5-nitrate. 4,297,286, Cl. 260-347.800.

Sandvik Aktiebolag: *See*—
Larsson, Lars E., 4,296,825, Cl. 175-410.000.

Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, to Sumitomo Chemical

Company, Limited. 3,5-Dioxo-1,2,4-triazines. 4,297,129, Cl. 71-93.000.
Sanford, Michael E.: *See*—
Detroit, William J.; and Sanford, Michael E., 4,296,813, Cl. 166-293.000.
Sanol Schwarz-Monhein GmbH: *See*—
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Santa Fe International Corporation: *See*—
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, 4,297,054, Cl. 405-168.000.
Sartorelli, Adelmo: *See*—
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Sasaki, Makoto: *See*—
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.
Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, to Kureha Kugaku Kogyo Kabushiki Kaisha. Concentric composite conjugate yarns and a process for manufacturing same. 4,297,413, Cl. 428-394.000.
Sato, Akira: *See*—
Okano, Hiroshi; and Sato, Akira, 4,296,648, Cl. 74-798.000.
Sato, Eiichi, to Olympus Optical Company Limited. Electrophotographic process for printing a plurality of copies. 4,297,422, Cl. 430-54.000.
Sato, Fumio: *See*—
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Sato, Haruyo: *See*—
Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, 4,297,477, Cl. 528-323.000.
Sato, Hideo; and Shimamune, Takayuki, to Permelec Electrode Ltd. Electrode for use in electrolysis and process for production thereof. 4,297,195, Cl. 204-290.00F.
Sato, Hisatake; Makino, Masaharu; and Hayashi, Hideo, to Nippon Oil Co. Ltd. Hot melt type traffic paint compositions. 4,297,450, Cl. 525-333.000.
Sato, Kazuyoshi: *See*—
Ando, Ryo; and Sato, Kazuyoshi, 4,297,119, Cl. 65-141.000.
Sato, Kotaro: *See*—
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Sato, Kunio: *See*—
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Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Anti-skid brake control device. 4,296,972, Cl. 303-119.000.
Sato, Masamichi: *See*—
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, 4,297,436, Cl. 430-310.000.
Sato, Yoshikatsu: *See*—
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Satoh, Seiji: *See*—
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Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, to Mitsubishi Paper Mills, Ltd. Color-developing sheet for no-carbon copying process. 4,296,948, Cl. 282-27.500.
Satoi, Shuzo: *See*—
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.
Satomura, Masato: *See*—
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 4,297,470, Cl. 526-304.000.
Sauber, Charles J. Cargo securing apparatus. 4,297,062, Cl. 410-37.000.
Saucedo, Rudy E. Portable dishwasher. 4,296,768, Cl. 134-47.000.
Saunders, Norman B. Heating, lighting and ventilation systems. 4,296,733, Cl. 126-428.000.
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. α-Azolyl-α-phenylacetic acid derivatives. 4,297,364, Cl. 424-267.000.
Sauvage, Henri; and Tarnero, Maurice, to Commissariat a l'Energie Atomique. Apparatus for the continuous processing of compounds in a liquid. 4,297,324, Cl. 422-268.000.
Savage, David S.: *See*—
Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., 4,297,351, Cl. 424-241.000.
Sawada, Satoru: *See*—
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Sbuelz, Anes; and Marchelli, Francesco, to Societa Italiana Telecomunicazioni Siemens S.p.A. Malfunction detector for a group of cyclically interconnected phase-locked oscillators. 4,297,649, Cl. 331-2.000.
Scalera, Frank T.: *See*—
Mitchell, Robert P.; and Scalera, Frank T., 4,296,872, Cl. 221-195.000.
Scalise, John M.: *See*—
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Schabert, Hans-Peter, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation. 4,297,167, Cl. 376-273.000.
Schaefer, Edward J., to Franklin Electric Co., Inc. Electric motor construction. 4,297,627, Cl. 318-778.000.
Schaefer, John O., to International Business Machines Corporation. Variable cam profile selection system for single element typewriter. 4,297,041, Cl. 400-161.400.
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Dasher, George F.; and Schamper, Thomas J., 4,297,098, Cl. 8-412.000.
Scheffler, Knut; and Riege, Ulrich, to Kernforschungszentrum Karlsruhe, GmbH. Method for solidifying aqueous radioactive wastes for non-contaminating storage. 4,297,304, Cl. 264-0.500.
Scheibel, Edward G., to Suntech, Inc. Solvent extraction of synfuel liquids. 4,297,206, Cl. 208-254.00R.
Scheible, Howard G.: *See*—
Carroll, Charles B.; and Scheible, Howard G., 4,297,312, Cl. 264-134.000.
Schelleng, Robert D.: *See*—
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Schenck, Hans-Uwe; and Gulbins, Erich, to BASF Aktiengesellschaft. Adduct and its use. 4,297,255, Cl. 260-18.0PF.
Schepp, Hans-Egon: *See*—
Romer, Rudolf; and Schepp, Hans-Egon, 4,296,685, Cl. 102-387.000.
Schering Aktiengesellschaft: *See*—
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Schering Corporation: *See*—
Blythin, David J., 4,297,355, Cl. 424-248.540.
Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, to Filtrol Corporation. Method of producing pseudoboehmite from aluminum salt solutions. 4,297,325, Cl. 423-122.000.
Schetter, Thomas C., to Dana Corporation. Transmission interlock. 4,296,642, Cl. 74-475.000.
Schick, Ludwig: *See*—
Glaser, Helmut; and Schick, Ludwig, 4,297,632, Cl. 324-51.000.
Schittenhelm, Rudolf: *See*—
Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.
Schlagmuller, Walter, to Robert Bosch GmbH. Drive arrangement for auxiliary aggregates of an internal combustion engine. 4,296,717, Cl. 123-195.00A.
Schlauer, Johann; Kempf, Georg; and Doerges, Alexander, to Metallgesellschaft AG. Process of selectively desulfurizing gases. 4,297,330, Cl. 423-232.000.
Schlegel, Hans; and Nowotny, Theodor, to Wurttembergische Metallwarenfabrik. Process for partially electroplating flat silver. 4,297,175, Cl. 204-15.000.
Schleppinghoff, Bernhard: *See*—
Mainusch, Klaus; Schleppinghoff, Bernhard; and Munter, Klaus, 4,297,512, Cl. 564-490.000.
Schliebener, Claus; and Wernicke, Hans J., to Linde Aktiengesellschaft. Thermal cracking with post hydrogenation and recycle of heavy fractions. 4,297,204, Cl. 208-95.000.
Schlottke, Karl-Heinz: *See*—
Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, 4,297,066, Cl. 414-43.000.
Schlumpf, Alois, to Tax o mex AG. Automatic vending arrangement. 4,296,873, Cl. 221-213.000.
Schmid, Franz; and Schmid, Reinhard. Method and apparatus for withdrawing agricultural materials from storage. 4,297,073, Cl. 414-704.000.
Schmid, Johann, to REPA Feinstanzwerk GmbH. Swivel fitting for fitting parts of a safety belt. 4,296,525, Cl. 16-174.000.
Schmid, Reinhard: *See*—
Schmid, Franz; and Schmid, Reinhard, 4,297,073, Cl. 414-704.000.
Schmidt, Waldemar, to Robert Bosch GmbH. Method for permanent deformation of an elastic member. 4,297,314, Cl. 264-320.000.
Schmitt, Gunter: *See*—
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Schmitt, Wilhelm E., to Friedman, Jack S. Brush. 4,296,519, Cl. 15-184.000.
Schnabele, Werner; Buckley, Jack; and Rieger, Ulrich, to Messerschmitt-Bolkow-Blohm GmbH. Drone-type missile. 4,296,894, Cl. 244-3.270.
Schneider, Claus: *See*—
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Schneider, George H.: *See*—
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Schnoes, Heinrich K.: *See*—
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Schoenberg, Morris R.: *See*—
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Schonfeld, Bernd: *See*—
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Schopper, Heinrich-Christian: *See*—
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Schramm, Horst. Integrated house. 4,296,798, Cl. 165-56.000.
Schreck, Raymond M.: *See*—
Griffin, James R.; and Schreck, Raymond M., 4,296,611, Cl. 62-89.000.

Schreckenberg, Manfred: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.

Schroder, Klaus, to C. & W. Berges Maschinenfabrik, Firma. Extruder for preplasticization of thermoset molding materials. 4,297,036, Cl. 366-77.000.

Schroeder, Harald: *See*—
Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, 4,297,493, Cl. 544-241.000.

Schroeder, Hartmut R.: *See*—
Buckler, Robert T.; and Schroeder, Hartmut R., 4,297,273, Cl. 260-112.00B.

Schuette, Heinz G. Helical staircase support. 4,296,577, Cl. 52-187.000.

Schulein, Benjamin M., Jr., to Alfa-Pet, Inc. Animal litter preparation. 4,296,709, Cl. 119-1.000.

Schulze-Berge, Klaus: *See*—
Manzke, Klaus; Broizler, Roland; and Schulze-Berge, Klaus, 4,297,736, Cl. 360-109.000.

Schwab, Thomas C.: *See*—
Miller, John G.; and Schwab, Thomas C., 4,297,131, Cl. 75-1.00T.

Schwartz, Robert E.: *See*—
Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., 4,297,094, Cl. 431-202.000.

Schwarz, Rudolf: *See*—
Kleinschmit, Peter; and Schwarz, Rudolf, 4,297,143, Cl. 501-103.000.

Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, to Siemens Aktiengesellschaft. Radiation diagnostic device for generating tomographic images. 4,297,582, Cl. 250-445.00T.

Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Herchenhan, Bernd, to Behringwerke Aktiengesellschaft. Blood coagulation factors and process for their manufacture. 4,297,344, Cl. 424-101.000.

Schwob, Pierre, to SEB S.A. Water injection device for a steam iron. 4,296,560, Cl. 38-77.810.

Scifres, Donald R.; and Stutius, Wolfgang E., to Xerox Corporation. Hybrid semiconductor laser/detectors. 4,297,653, Cl. 331-94.50S.

SEB S.A.: *See*—
Schwob, Pierre, 4,296,560, Cl. 38-77.810.

Sebag, Henry: *See*—
Vanlerberghe, Guy; and Sebag, Henry, 4,297,102, Cl. 8-406.000.

Seidel, Martin P., to Westinghouse Electric Corp. Low temperature curing epoxy resin. 4,297,254, Cl. 260-18.0EP.

Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, to Anritsu Electric Company Limited. Multi-item data input apparatus. 4,297,028, Cl. 355-41.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, 4,296,954, Cl. 285-331.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Sugito, Kazuo; and Takeda, Sakuzo, 4,297,109, Cl. 44-56.000.

Sele, Alex: *See*—
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.

Selines, Ronald J.: *See*—
Kilinskas, William A.; Selines, Ronald J.; and Vand den Sype, Jaak S., 4,296,512, Cl. 10-27.00E.

Semenov, Vasily V.: *See*—
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A., 4,297,589, Cl. 290-40.00R.

Semiconductor Research Foundation Mitsubishi Denki K.K.: *See*—
Nishizawa, Jun-Ichi; and Kitsuregawa, Takashi, 4,297,718, Cl. 357-22.000.

Senet, Jean-Pierre G.: *See*—
Lecolier, Serge L.; and Senet, Jean-Pierre G., 4,297,301, Cl. 260-544.00K.

Senoh, Hideaki: *See*—
Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, 4,296,948, Cl. 282-27.500.

Serac: *See*—
Graffin, Andre J., 4,297,161, Cl. 156-583.300.

Sermon, Paul A., to Johnson, Matthey & Co., Limited. Catalysis. 4,297,331, Cl. 423-239.000.

Severijns, Adrianus P.; and Staas, Frans A., to U.S. Philips Corporation. ^{3}He-^{4}He refrigerator. 4,296,609, Cl. 62-514.00R.

Seymour, Raymond K.; and Murphy, Frank H., to General Electric Company. Circuit breaker accessories packaged in a standardized molded case. 4,297,663, Cl. 335-20.000.

Shackcloth, Barry, to Total Oil Great Britain Limited. Safety device for container filler systems. 4,297,543, Cl. 200-18.000.

Shackelford, John R., to Standard Oil Company (Indiana). Salt substitutes having reduced bitterness. 4,297,375, Cl. 426-62.000.

Shah, Narendra K.: *See*—
Elias, Moenes L.; and Shah, Narendra K., 4,297,257, Cl. 260-29.60H.

Shah, Siddharth A.; Woodcock, Sidney J.; and Fagan, Robert D., to General Electric Company. Manway handling apparatus. 4,297,072, Cl. 414-684.300.

Sharp Kabushiki Kaisha: *See*—
Hashimoto, Sadakatsu, 4,297,696, Cl. 340-785.000.

Shatai Kogyo Kabushiki Kaisha: *See*—
Terada, Takami, 4,296,966, Cl. 297-369.000.

Shaw, Manuel; and Thatcher, Imbrie, to Interscan Corporation. Personnel-carried dosimeter. 4,297,689, Cl. 340-632.000.

Shell Oil Company: *See*—
Davis, Royston H.; and Davies, John H., 4,297,496, Cl. 544-332.000.
Mango, Frank D., 4,297,294, Cl. 260-453.0PH.
Mast, Harm, 4,296,628, Cl. 73-28.000.
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,297,517, Cl. 568-361.000.

Shephard, Margaret C.: *See*—
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Shepherd, Roger D.: *See*—
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.

Sherman, Norman; and Cameron, John H., to Conwed Corporation. Method of manufacturing improved mineral board. 4,297,311, Cl. 264-109.000.

Sherman, Paul D., Jr.: *See*—
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,297,241, Cl. 252-435.000.

Sherwood Medical Industries Inc.: *See*—
Joslin, Joel A.; and Ranford, Alan B., 4,296,759, Cl. 128-766.000.

Shibanaka, Akira: *See*—
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, 4,296,719, Cl. 123-198.00F.

Shibuya, Yasutaka: *See*—
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.

Shigeta, Yoshihiro: *See*—
Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,297,013, Cl. 354-23.00D.

Shiina, Yuichi: *See*—
Tokunaga, Shinobu; and Shiina, Yuichi, 4,297,141, Cl. 501-67.000.

Shimamune, Takayuki: *See*—
Sato, Hideo; and Shimamune, Takayuki, 4,297,195, Cl. 204-290.00F.

Shimano Industrial Company, Limited: *See*—
Isobe, Mitsuhide, 4,296,850, Cl. 192-64.000.

Shimizu, Ken-Ichi; and Ikeya, Chuji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for measurement of displacement of moving body by use of target mark and apparatus therefor. 4,297,725, Cl. 358-125.000.

Shimizu, Michimasa: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.

Shimotake, Munetoshi: *See*—
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.

Shinmyo, Saburo, to Nippon Electric Co., Ltd. Phase locked loop carrier recovery circuit with false lock prevention. 4,297,650, Cl. 331-11.000.

Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst supported oxygen sensor element and a method of manufacturing same. 4,297,192, Cl. 204-195.00S.

Shionogi & Co., Ltd.: *See*—
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,297,280, Cl. 260-245.500.

Shirai, Akira: *See*—
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.

Shirasu, Hiroshi: *See*—
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.

Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P. Drawing mechanism. 4,296,528, Cl. 19-255.000.

Shono, Tatsuya. Process for preparing ketones. 4,297,181, Cl. 204-78.000.

Short, James N.; and Norwood, Donald D., to Phillips Petroleum Co. Continuous production of olefin block copolymers. 4,297,445, Cl. 525-52.000.

Shumway, Anthony G. Folded circuit switch apparatus having multiple contacts. 4,297,542, Cl. 200-6.00A.

Shur-Lok International, S.A.: *See*—
Heurteux, Bernard M., 4,296,586, Cl. 52-787.000.

Sico Incorporated: *See*—
Wilson, Kermit H.; and Carlson, Ronald R., 4,296,573, Cl. 52-6.000.

Sidaway, H. John; and Good, Maynard, to Hancor, Inc. Expandable core for rolls of tubing. 4,296,891, Cl. 242-110.000.

Siemens Aktiengesellschaft: *See*—
Brunner, Anton; and Willburger, Nikolaus, 4,297,707, Cl. 343-725.000.
Dalhof, Axel; and Lechner, Robert, 4,297,531, Cl. 179-16.0AA.
Glaser, Helmut; and Schick, Ludwig, 4,297,632, Cl. 324-51.000.
Gross, Franz; Boehme, Gerit; Wiehler, Wolf; and Bibracher, Wilhelm, 4,297,662, Cl. 333-252.000.
Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, 4,297,664, Cl. 335-176.000.
Roesler, Helmut; and Muehlbauer, Otto, 4,297,591, Cl. 307-224.00C.

Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.
Url, Karlheinz; and von Basse, Paul W., 4,297,592, Cl. 307-583.000.

Sigmund, Paul W.; and Butwell, Kenneth F., to Union Carbide Corporation. Vapor-liquid contacting system. 4,297,329, Cl. 423-228.000.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-6a-carba-PGI$_1$ compounds. 4,297,504, Cl. 560-119.000.

Silcox, David R.; and Doster, John L., to RCA Corporation. Filament winding apparatus. 4,297,095, Cl. 432-59.000.

Silk, John K., to American Science and Engineering, Inc. Parabolic trough concentrating solar collector. 4,296,737, Cl. 126-438.000.

Sillers, William M., III. Automatic feeding apparatus. 4,296,710, Cl. 119-51.110.

Silver, Alexander: *See—*
Burgmeier, Lyman R.; McCarty, Frederick B.; and Silver, Alexander, 4,296,544, Cl. 29-598.000.

Simmonds Precision Products, Inc.: *See—*
Maier, Lawrence C., 4,297,692, Cl. 340-715.000.

Simmons, Dwane P.; and Lynn, Ray E. Portable invalid lift. 4,296,509, Cl. 5-81.00R.

Simmons, Robert B.: *See—*
Crawford, Roger A.; and Simmons, Robert B., 4,297,333, Cl. 423-241.000.

Simon Engineering Dudley Limited: *See—*
Ashworth, Denis H., 4,296,833, Cl. 182-2.000.

Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Process for the production of a synthetic resin sheet material which is dyed unicolored or multicolored in accordance with a pattern. 4,297,099, Cl. 8-484.000.

Simon-Rosedowns Limited: *See—*
Naylor, Leonard, 4,297,112, Cl. 55-195.000.

Simpson, Harold G.; and Davis, Michael W., to Star Manufacturing Company of Oklahoma. Construction system and fasteners therefore. 4,296,582, Cl. 52-590.000.

Sims, Malcolm L.: *See—*
Foster, Alan I.; Sims, Malcolm L.; and Young, Dennis, 4,297,150, Cl. 148-6.300.

Singer Company, The: *See—*
Davidson, Donald R.; and Marsh, Walter H. W., 4,296,698, Cl. 112-110.000.
Larsen, Robert H., 4,296,701, Cl. 112-168.000.
Lauritsen, Richard L.; and Mandellos, Panagiotis K., 4,297,552, Cl. 200-83.00P.
Vartoukian, Artin G., 4,296,699, Cl. 112-121.150.
Whitby, Clyde M., 4,297,723, Cl. 358-60.000.

Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, to Kali and Salz AG. Process and apparatus for the electrostatic dressing of carnallite-containing crude potassium salts. 4,297,207, Cl. 209-9.000.

Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,297,362, Cl. 424-262.000.
Lesher, George Y.; and Singh, Baldev, 4,297,363, Cl. 424-263.000.

Singh, Shobha: *See—*
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,297,005, Cl. 350-357.000.

SKF Kugellagerfabriken GmbH: *See—*
Loser, Norbert; and Tilgner, Leopold, 4,296,978, Cl. 308-37.000.

Sklensky, Alden F.: *See—*
Buchanan, Robert A.; Maple, T. Grant; and Sklensky, Alden F., 4,297,584, Cl. 250-483.000.

Skomoroski, Robert M., to American Chemical & Refining Company Incorporated. Palladium electroplating bath and process. 4,297,179, Cl. 204-47.000.

Slater Electric Inc.: *See—*
Bowden, Wade R., Jr., 4,297,525, Cl. 174-58.000.

Slater, Peter G. Carrying device. 4,296,788, Cl. 150-52.00R.

Sleigh, Thomas: *See—*
Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., 4,297,351, Cl. 424-241.000.

Sletzinger, Meyer: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,297,488, Cl. 544-21.000.

Smart, Michael W.: *See—*
Andrews, David K.; and Smart, Michael W., 4,296,676, Cl. 91-417.00R.

Smearing, Robert W., to General Electric Company. Antifoaming resin compositions. 4,297,389, Cl. 427-58.000.

Smick, Ronald H. Turbulator with ganged strips. 4,296,779, Cl. 138-38.000.

Smith, Douglas R.: *See—*
Rivenbark, Morrison, 4,297,223, Cl. 210-754.000.

Smith, Elroy C., Jr.; and Yao, Shi K., to Rockwell International Corporation. Deposition of ordered crystalline films. 4,297,189, Cl. 204-192.0SP.

Smith, Gordon J.: *See—*
Lammers, Gerald B.; and Smith, Gordon J., 4,297,712, Cl. 346-75.000.

Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., to Halliburton Company. Simultaneous gamma ray measurement of formation bulk density and casing thickness. 4,297,575, Cl. 250-265.000.

Smith, Kenneth J.: *See—*
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., 4,297,575, Cl. 250-265.000.

Smith, Kent F., to General Instrument Corporation. I^2L Sensing circuit with increased sensitivity. 4,297,598, Cl. 307-355.000.

Smith, Mark A.: *See—*
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L., 4,297,120, Cl. 65-281.000.

Smith, Millard S.: *See—*
Wyse, Harold G.; and Smith, Millard S., 4,297,123, Cl. 71-58.000.

Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L. Glass bending table. 4,297,120, Cl. 65-281.000.

Smith, Robert L.: *See—*
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L., 4,297,120, Cl. 65-281.000.

Smith, Thomas M., to Monarch Marking Systems, Inc. Coreless pressure sensitive label supply roll. 4,297,403, Cl. 428-42.000.

Smith, Thomas W., to Eastman Kodak Company. Catalysts for polymerizing propylene in a high temperature solution process. 4,297,465, Cl. 526-141.000.

Smitka, Gunter. Device for attaching two metal sheets or blanks together. 4,297,049, Cl. 403-403.000.

Snamprogetti S.p.A: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.

Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Manca, Francesco, 4,297,407, Cl. 428-224.000.

Soboczenski, Edward J., to Du Pont de Nemours, E. I., and Company. Insecticidal compositions. 4,297,370, Cl. 424-298.000.

Socapex: *See—*
Malsot, Christian; and Bouygues, Jean, 4,296,997, Cl. 350-96.200.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Sbuelz, Anes; and Marchelli, Francesco, 4,297,649, Cl. 331-2.000.

Societe Anonyme dite: Ramo S.A.: *See—*
Champeau, Marcel; and Tabutin, Andre, 4,296,658, Cl. 82-30.000.

S.A. PRB Societe Anonyme: *See—*
Orlandi, Robert G., 4,296,688, Cl. 102-218.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Horman, Ian; and Cazenave, Paul, 4,297,380, Cl. 426-597.000.

Societe d'Etude du Radant: *See—*
Vidal, Paul, 4,297,708, Cl. 343-754.000.

Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
Curtil, Remi; and Devaux, Alain, 4,296,715, Cl. 123-90.150.

Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,297,495, Cl. 544-330.000.

Societe d'Etudes, Recherches et Constructions Electroniques Sercel: *See—*
Nard, Georges; Rabian, Jean; and Rouaud, Michel, 4,297,700, Cl. 343-6.50R.

Societe Miniere et Metallurgique de Penarroya: *See—*
Georgeaux, Andre, 4,297,183, Cl. 204-117.000.

Societe Nationale des Poudres et Explosifs: *See—*
Lecolier, Serge L.; and Senet, Jean-Pierre G., 4,297,301, Cl. 260-544.00K.

Societe Nationale Industrielle Aerospatiale: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.

Solar Kinetics, Inc.: *See—*
Hutchison, Joseph A., 4,297,003, Cl. 350-292.000.

Solarex Corporation: *See—*
Lindmayer, Joseph, 4,297,391, Cl. 136-256.000.

Solomon, Edward T.: *See—*
Priest, Clayton W.; and Solomon, Edward T., 4,296,763, Cl. 132-7.000.

Solomon, Paul W.: *See—*
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,297,451, Cl. 525-366.000.

Solow, Benjamin, to Angstrohm Precision, Inc. Metal foil resistor. 4,297,670, Cl. 338-195.000.

Sommer, Karl: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.

Soot, Olaf. Folded plate solar energy collector. 4,296,736, Cl. 126-438.000.

Sorbier, Pierre. Method of making moldable product. 4,297,253, Cl. 260-17.300.

Sorokin, Nikolai A.: *See—*
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A., 4,297,589, Cl. 290-40.00R.

Spaeth, Tilman P., to Bodenseewerk Geosystem GmbH. Bi-frequency infrared spectrometer. 4,297,579, Cl. 250-343.000.

Spahn, Heinrich: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.

Spak, Mark A.: *See—*
Denning, Richard; Spak, Mark A.; and Polhemus, Barry, 4,297,393, Cl. 427-88.000.

Sparrell, Patricia T.: *See—*
Vogt, Frederick G., deceased; and Sparrell, Patricia T., 4,297,317, Cl. 422-16.000.

Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., to Mead Corporation, The. Pressure-sensitive transfer sheets using novel radiation curable coatings. 4,296,947, Cl. 282-27.500.

Speak, Richard C.; and Ferm, Donald J., to United States Borax & Chemical Corporation. Particulate borate-soap compositions. 4,297,229, Cl. 252-109.000.

Speca, Anthony N., to National Petro Chemicals Corp. Olefin polymerization catalyst. 4,297,461, Cl. 526-100.000.

Specktor, Gerald A. Accessory for an apparatus for repairing and straightening. 4,296,624, Cl. 72-308.000.

Sperry Corporation: *See—*
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., 4,296,591, Cl. 56-10.300.
McIlwain, Irwin D., 4,296,592, Cl. 56-14.400.
Spilsbury, Thomas W., 4,297,618, Cl. 315-371.000.
Spilsbury, Thomas W., 4,297,621, Cl. 315-397.000.
Waldrop, T. William; and Campbell, Willis R., 4,296,596, Cl. 56-341.000.

Sperry - New Holland: *See—*
Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., 4,296,593, Cl. 56-98.000.

Spiess, Karl-Heinz: *See—*
Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, 4,297,099, Cl. 8-484.000.

Spilsbury, Thomas W., to Sperry Corporation. Anode voltage deflection gain control for cathode ray displays. 4,297,618, Cl. 315-371.000.

Spilsbury, Thomas W., to Sperry Corporation. Cathode ray tube beam deflection amplifier system. 4,297,621, Cl. 315-397.000.

Spinner GmbH Elektrotechnische Fabrik: *See—*
Treczka, Leo, 4,297,658, Cl. 333-113.000.

Spletzer, Barry L., to Gerber Products Company. Flexible convex diaphragm sound reproducing device. 4,297,682, Cl. 340-384.00E.

Spodig, Heinrich. Magnetic separator having two rotating magnetic drums of opposite polarity. 4,296,865, Cl. 209-216.000.

Square D Company: *See—*
Lingaraju, Bhartoor, 4,296,987, Cl. 339-95.00D.

Staas, Frans A.: *See—*
Severijns, Adrianus P.; and Staas, Frans A., 4,296,609, Cl. 62-514.00R.

Staclean Diffuser Company: *See—*
Johnson, Allen S., Jr., 4,297,115, Cl. 55-302.000.

Staffa, Jeffrey A.: *See—*
Lionelle, Joseph E.; and Staffa, Jeffrey A., 4,297,291, Cl. 260-410.90R.

Stahlschmitt, Horst: *See—*
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, 4,296,697, Cl. 112-109.000.

Stalder, John L.; and Martin, William L., to Conoco Inc. Method for thermally insulating wellbores. 4,296,814, Cl. 166-303.000.

Stan Herman Studio, Inc.: *See—*
Herman, Seymour S., 4,296,497, Cl. 2-114.000.

Standard Oil Company (Indiana): *See—*
Calamur, Narasimhan; and Schoenberg, Morris R., 4,296,637, Cl. 73-863.110.
Ford, William D.; and Clark, Michael J., 4,297,203, Cl. 208-74.000.
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,297,242, Cl. 252-439.000.
Mieville, Rodney L., 4,297,205, Cl. 208-138.000.
Shackelford, John R., 4,297,375, Cl. 426-62.000.

Stanton, David B.: *See—*
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,297,241, Cl. 252-435.000.

Star Manufacturing Company of Oklahoma: *See—*
Simpson, Harold G.; and Davis, Michael W., 4,296,582, Cl. 52-590.000.

Stark, Charles J., Jr., to General Electric Company. Curable epoxy resin composition. 4,297,457, Cl. 525-507.000.

Stark, Charles J., Jr., to General Electric Company. Curable epoxy resins. 4,297,458, Cl. 525-507.000.

Stark, Charles J., Jr., to General Electric Company. Curable epoxy resins. 4,297,459, Cl. 525-507.000.

Static Systems Corporation: *See—*
Lester, Robert W., 4,297,022, Cl. 355-3.00R.

Staub, Vincent M., Jr., to General Motors Corporation. Flexible clutch with an elastomeric vibration damper. 4,296,854, Cl. 192-106.100.

Stauffer Chemical Company: *See—*
Gaughan, Edmund J.; and Kezerian, Charles, 4,297,295, Cl. 260-455.00A.
Hosaka, Dennis B., 4,297,382, Cl. 426-656.000.
Weil, Edward D., 4,297,138, Cl. 106-18.180.

Stead, John C.; and Waghorn, Peter E., to Imperial Chemical Industries Limited. Laminates of cloth and filled crystalline polypropyiene and a method for making them. 4,297,408, Cl. 428-240.000.

Steele, Everett T., Jr., to Robertshaw Controls Company. Control system having an improved condition responsive valve construction. 4,296,721, Cl. 123-407.000.

Steele, Richard S. Solar water tank and method of making same. 4,296,799, Cl. 165-74.000.

Steffen, Klaus-Dieter. *See—*
Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, 4,297,502, Cl. 560-35.000.

Stegens, Ronald E., to Communications Satellite Corporation. Ferrite substrate microwave filter. 4,297,661, Cl. 333-204.000.

Steinhilper, Eric A.: *See—*
Kosek, Thomas P.; and Steinhilper, Eric A., 4,296,888, Cl. 239-403.000.

Stejskal, Joseph F.: *See—*
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.

Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, to Agfa-Gevaert AG. Apparatus for exposing and developing photosensitive material. 4,297,027, Cl. 355-27.000.

Stendel, Wilhelm: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.
Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, 4,297,371, Cl. 424-304.000.

Stephens, William I., to Knoll International, Inc. Floor panel-furniture support system. 4,296,574, Cl. 52-27.000.

Sterling Drug Inc.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,297,360, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,297,362, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,297,363, Cl. 424-263.000.

Sterzer, Fred, to RCA Corporation. Serrodyning system employing an adjustable phase shifting circuit. 4,297,641, Cl. 328-15.000.

Stevens, Donald G.: *See—*
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.

Stevens, Francis J., to General Electric Company. Watthour meter and battery retaining apparatus therefor. 4,297,635, Cl. 324-156.000.

Steynor, James H.; and Hayes, Frederick, to EMI Limited. Encoding and decoding of digital recordings. 4,297,729, Cl. 360-40.000.

Stock, Hugh J.: *See—*
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.

Stockburger, George J., to ICI Americas Inc. Process for preparing sorbitan esters. 4,297,290, Cl. 260-410.600.

Stokkers, Henk, to Maryland Cup Corporation. Lidded container structure and package structure for same. 4,296,863, Cl. 206-504.000.

Stone & Webster Engineering Corp.: *See—*
Charlton, Webster T., 4,296,837, Cl. 184-15.00R.

Stoneleigh Trust, The: *See—*
Massa, Frank, 4,297,538, Cl. 179-180.000.

Stoute, Neville, Sr.; and Pennise, Robert J., to Falborn, James A.; and Bird, Richard M., part interest to each. Invalid chair. 4,296,506, Cl. 4-480.000.

Stowers, Jeffery P.; and Stowers, Kimball E., to Virginia Panel Corporation. Electrical connector having insulated locking shell for use on panel having metal ground plane. 4,296,990, Cl. 339-128.000.

Stowers, Kimball E.: *See—*
Stowers, Jeffery P.; and Stowers, Kimball E., 4,296,990, Cl. 339-128.000.

Strahan, Virgil H.: *See—*
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,296,994, Cl. 350-3.730.

Stranders, Roelof J., to Werner Weber Holding AB. Holder for liquid packaging containers. 4,296,958, Cl. 294-27.00H.

Straslicka, William A., to Carrier Corporation. Method of providing a sealing assembly between a steam chest and turbine casing. 4,296,538, Cl. 29-156.40R.

Strefling, Michael R. Alfalfa pelletizing apparatus. 4,297,091, Cl. 425-84.000.

Studebaker, Irving G.: *See—*
Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., 4,296,968, Cl. 299-2.000.

Sturgeon, Benjamin R.: *See—*
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., 4,296,924, Cl. 272-117.000.

Stutius, Wolfgang E.: *See—*
Scifres, Donald R.; and Stutius, Wolfgang E., 4,297,653, Cl. 331-94.50S.

Sudarsanam, Vasudevan: *See—*
Rajappa, Srinivasachari; and Sudarsanam, Vasudevan, 4,297,365, Cl. 424-270.000.

Sugano, Kazuhiko: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,296,651, Cl. 74-869.000.

Sugasawa, Fukashi: *See—*
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,296,724, Cl. 123-568.000.

Sugimoto, Norimaro: *See—*
Kinbara, Koichi; Sugimoto, Norimaro; and Nakazawa, Toshitaka, 4,297,402, Cl. 428-35.000.

Sugito, Kazuo; and Takeda, Sakuzo, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Fuel composition. 4,297,109, Cl. 44-56.000.

Sugiura, Susumu: *See—*
Hirayama, Kazuhiro; and Sugiura, Susumu, 4,297,716, Cl. 346-153.100.

Sugiura, Yoji: *See—*
Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,297,013, Cl. 354-23.00D.

Suhac, Peter; Hafner-Milac, Natasa; and Dolenc, Bozidar, to LEK, tovarna farmacevtskih in kemicnih izdelkov. n.sol.o. Sodium alumoglucoheptonate and a process for its preparation. 4,297,293, Cl. 260-448.00B.

Suling, Carlhans: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.

Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., to American Home Products Corporation. Method of suppressing cardiac arrhythmias. 4,297,373, Cl. 424-322.000.

Sullivan, Charles I., to Polaroid Corporation. Diffusion control layers in diffusion transfer photographic products. 4,297,431, Cl. 430-215.000.

Sulzer Brothers Limited: *See*—
Biller, Efim, 4,297,511, Cl. 564-331.000.
Sumida, Seizo: *See*—
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.
Sumita Optical Glass Manufacturing Co., Ltd.: *See*—
Tokunaga, Shinobu; and Shiina, Yuichi, 4,297,141, Cl. 501-67.000.
Sumitomo Bakelite Company Limited: *See*—
Koshibe, Shigeru; and Nanjo, Motoyuki, 4,297,473, Cl. 528-144.000.
Sumitomo Chemical Company, Ltd.: *See*—
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.
Maegawa, Yuzo; Masuko, Fujio; and Nakamura, Makoto, 4,297,508, Cl. 562-425.000.
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, 4,297,282, Cl. 260-326.200.
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.
Sumitomo Electric Industries, Ltd.: *See*—
Nishiyama, Yukinori; and Ichikawa, Hideji, 4,296,843, Cl. 188-73.430.
Nishizawa, Hideaki; and Iguchi, Shin-Ichi, 4,297,720, Cl. 357-30.000.
Sumitomo, Hiroyuki, to Hisaka Works, Ltd. Plate used in condenser. 4,296,803, Cl. 165-110.000.
Summers, William A.: *See*—
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., 4,297,443, Cl. 521-129.000.
Sun Aired Bag Co., Inc.: *See*—
Lefebvre, Henry R., 4,296,876, Cl. 223-91.000.
Sun, Yih-Yau: *See*—
Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, 4,297,325, Cl. 423-122.000.
Sundeen, Joseph E.; and Dejneka, Tamara, to E. R. Squibb & Sons, Inc. Inhibitors of mammalian collagenase. 4,297,275, Cl. 260-112.50R.
Suntech, Inc.: *See*—
Scheibel, Edward G., 4,297,206, Cl. 208-254.00R.
Thompson, Robert M., 4,297,454, Cl. 525-432.000.
Suntime, Inc.: *See*—
Cooper, George H., 4,296,729, Cl. 126-421.000.
Surgikos: *See*—
Mason, Stanley I., Jr.; and Handler, Michael D., 4,296,746, Cl. 128-201.150.
Suzuki, Kohji: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,297,182, Cl. 204-98.000.
Suzuki, Minoru: *See*—
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.
Suzuki, Sadao: *See*—
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,297,306, Cl. 264-23.000.
Suzuki, Shuichi: *See*—
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.
Suzuki, Tomio: *See*—
Morimoto, Kotaro; and Suzuki, Tomio, 4,297,093, Cl. 431-10.000.
Tabutin, Andre: *See*—
Champeau, Marcel; and Tabutin, Andre, 4,296,658, Cl. 82-30.000.
Tachikawa, Shiro: *See*—
Yamamoto, Minoru; Tachikawa, Shiro; and Maeno, Hiroo, 4,297,356, Cl. 424-248.570.
Tachikawa Spring Company, Limited: *See*—
Sakurada, Kenichi; and Nishino, Takaichi, 4,296,965, Cl. 297-284.000.
Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, to Hitachi, Ltd. Electrostatic recording apparatus. 4,297,715, Cl. 346-150.000.
Taddicken, Hermann; and Sachs, Wolfgang, to Eisele Apparate-und Geratebau GmbH. Device for producing sewing seam patterns of stitch groups. 4,296,696, Cl. 112-70.000.
Tak, Shiu M., to Wah Ming Electrics Limited. Brush assemblies for electric motors or generators. 4,297,605, Cl. 310-242.000.
Takada, Juichiro. Device for holding a passive vehicle restraint belt at a restraining position. 4,296,943, Cl. 280-804.000.
Takada, Takuzo: *See*—
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,297,306, Cl. 264-23.000.
Takagi, Yasushi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.
Takahashi, Kaneaki: *See*—
Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, 4,296,705, Cl. 114-219.000.
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, to Toyo Kogyo Co., Ltd. Multiple cylinder internal combustion engine having mixture cut off means. 4,296,719, Cl. 123-198.00F.
Takahata, Yasuyuki: *See*—
Ohdai, Yozo; and Takahata, Yasuyuki, 4,296,621, Cl. 72-130.000.
Takamatsu, Hiroshi: *See*—
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.
Takamizawa, Yuji: *See*—
Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, 4,297,507, Cl. 562-416.000.
Takaniemi, Tauno K. Automaton for dealing out food and drink. 4,296,980, Cl. 312-35.000.
Takara Belmont Co., Ltd.: *See*—
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.
Takechi, Hiroshi: *See*—
Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, 4,296,919, Cl. 266-111.000.
Takechi, Sanjuro: *See*—
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, 4,297,315, Cl. 264-322.000.
Takeda Chemical Industries, Ltd.: *See*—
Goto, Jugo; and Saegusa, Takeo, 4,297,449, Cl. 525-329.000.
Takeda, Sakuzo: *See*—
Sugito, Kazuo; and Takeda, Sakuzo, 4,297,109, Cl. 44-56.000.
Takeguchi, Masanobu; and Oyobe, Isao, to Marui Industry Co., Ltd. Method of purifying water in fish keeping water tank. 4,297,222, Cl. 210-748.000.
Takehara, Nobumitsu; and Isayama, Shogo, to Fuji Photo Film Co., Ltd. Coating method. 4,297,396, Cl. 427-284.000.
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, to Kyowa Hakko Kogyo Co., Ltd. Certain muscle relaxant 3-methyl-2-benzofuran acetamides. 4,297,369, Cl. 424-285.000.
Talley, Randall E., III: *See*—
Lidik, Albert F.; and Talley, Randall E., III, 4,296,683, Cl. 100-53.000.
Talmoen, Arne: *See*—
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.
Talon, Inc.: *See*—
Doerter, Randall H., 4,296,533, Cl. 24-216.000.
Tamasovics, John F.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,296,870, Cl. 220-3.300.
Tamura, Kohki: *See*—
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Tamura, Koichi; and Haraikawa, Tetsuo, to Tokico Ltd. Floating caliper type disc brake. 4,296,844, Cl. 188-73.380.
Tamura, Nobuhiro: *See*—
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.
Tanahashi, Toshio: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.
Tanaka, Hirokazu: *See*—
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Tanaka, Kouichi; and Amazawa, Kiyoshi, to Nippon Electric Co., Ltd.; and Clarion Co., Ltd. Automatic gain control circuit comprising a circuit for comparing a modulated signal with an envelope detected signal. 4,297,645, Cl. 330-280.000.
Tanaka, Mamoru: *See*—
Ishida, Takashi; and Tanaka, Mamoru, 4,296,907, Cl. 248-573.000.
Tanaka, Ryosaku: *See*—
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Tanaka, Takayasu: *See*—
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, 4,297,263, Cl. 260-32.6PQ.
Tang, Louis S., to Bendix Corporation, The. Hydraulic brake booster and control valve therefor. 4,296,671, Cl. 91-5.000.
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, to Teljin Limited. Cotton yarn-like textured composite yarn and a process for manufacturing the same. 4,296,597, Cl. 57-205.000.
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, to Ricoh Company, Ltd. Powder material transportation apparatus. 4,297,021, Cl. 355-3.00R.
Tanimoto, Akira: *See*—
Iwai, Michinobu; and Tanimoto, Akira, 4,297,555, Cl. 200-153.00G.
Tanno, Kiyohiko: *See*—
Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,297,715, Cl. 346-150.000.
Taplin, John F.: *See*—
Rogers, Stanley J. C.; and Taplin, John F., 4,296,983, Cl. 312-263.000.
Tarnero, Maurice: *See*—
Sauvage, Henri; and Tarnero, Maurice, 4,297,324, Cl. 422-268.000.
Tashiro, Sadaji: *See*—
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, 4,297,594, Cl. 307-252.00C.
Tatani, Atsushi; and Okino, Susumu, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treatment of a discharge liquid produced in treatment of an exhaust gas. 4,297,332, Cl. 423-240.000.
Tawse, Ian S., to Gen-Tech, Inc. Axial air gap alternators/generators of modular construction. 4,297,604, Cl. 310-168.000.
Tax o mex AG: *See*—
Schlumpf, Alois, 4,296,873, Cl. 221-213.000.
Taylor, Donald F.; and Bostock, James H., to Otis Engineering Corporation. High temperature well packer. 4,296,806, Cl. 166-120.000.

Taylor, Edward S.; and Hirschle, George W., to General Atomic Company. Vapor generator. 4,296,713, Cl. 122-32.000.

Taylor, Glenn R. Pushbutton operator. 4,297,556, Cl. 200-330.000.

Taylor, Gordon J., to Union Carbide Corporation. Process for producing carbon-carbon fiber composites suitable for use as aircraft brake discs. 4,297,307, Cl. 264-29.500.

Taylor, John R.: *See—*
Laishley, William J.; and Taylor, John R., 4,297,734, Cl. 360-78.000.

Taylor, Thomas. Respiratory monitor and excessive intrathoracic or abdominal pressure indicator. 4,296,757, Cl. 128-721.000.

Techinter S.A.: *See—*
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.

Technical Research of Citizen Watch Co., Ltd.: *See—*
Nishimura, Katsuo; and Nanya, Takanori, 4,297,004, Cl. 350-336.000.

Technicare Corporation: *See—*
Mezrich, Reuben S.; Colleoni, Alec; and Lyons, David J., 4,297,009, Cl. 352-86.000.

Teledyne Industries, Inc.: *See—*
Campagna, Barry A., 4,296,617, Cl. 70-63.000.

Telefonaktiebolaget L M Ericsson: *See—*
Augst, Horst G., 4,297,659, Cl. 333-191.000.

Teljin Limited: *See—*
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, 4,296,597, Cl. 57-205.000.

Tellier, Pierre: *See—*
Delavarenne, Serge Y.; Dubreux, Bernard; and Tellier, Pierre, 4,297,288, Cl. 260-378.000.

Temple, Paul A., to United States of America, Navy. Dark field surface inspection illumination technique. 4,297,032, Cl. 356-366.000.

Tenuta, Antonio. Method of freezing tomatoes. 4,297,381, Cl. 426-615.000.

Terada, Takami, to Aisin Seiki Kabushiki Kaisha; and Shatai Kogyo Kabushiki Kaisha. Seat for an automotive vehicle. 4,296,966, Cl. 297-369.000.

Teramachi, Hiroshi. Linear ball bearing unit. 4,296,974, Cl. 308-6.00C.

Terry, Ronald E.: *See—*
Morris, Charles W.; and Terry, Ronald E., 4,296,811, Cl. 166-273.000.

Terui, Yohji: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.

Terumo Corporation: *See—*
Kobayashi, Susumu, 4,296,882, Cl. 233-21.000.

Tesoro, Joseph. Slip joint pliers. 4,296,655, Cl. 81-405.000.

Tessler, Martin M., to National Starch and Chemical Corporation. Novel N-(alkyl)-N-(2-haloethyl)-aminomethylphosphonic acids, a method for the preparation thereof and their use in the preparation of starch ether derivatives. 4,297,299, Cl. 260-502.500.

Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, to Hoechst Aktiengesellschaft. Pressure vessel having quick-action locking means. 4,297,323, Cl. 422-208.000.

Texaco Development Corp.: *See—*
Gilbert, Richard J.; and Rice, Doris M., 4,297,444, Cl. 521-160.000.
Hunter, Walter D., 4,297,226, Cl. 252-8.55D.
Hunter, Walter D., 4,297,469, Cl. 526-287.000.

Texaco Inc.: *See—*
Bartley, Burton H.; and Estes, John H., 4,297,245, Cl. 252-460.000.
Kalfoglou, George, 4,296,812, Cl. 166-274.000.
Witte, Arnold C.; and Coleman, Richard L., 4,297,227, Cl. 252-18.000.

Texas Instruments Incorporated: *See—*
Mundt, Randall S.; Wooldridge, Timothy A.; and Blasingame, Thomas O., 4,297,162, Cl. 156-643.000.
Parsons, Robert, 4,297,693, Cl. 340-744.000.

TGS Systems, Inc.: *See—*
Rhonehouse, Donald E., 4,297,121, Cl. 65-348.000.

Thatcher, Imbrie: *See—*
Shaw, Manuel; and Thatcher, Imbrie, 4,297,689, Cl. 340-632.000.

Theodore, Louis. Gas filtration apparatus. 4,297,113, Cl. 55-213.000.

Therm-O-Disc, Incorporated: *See—*
Place, Donald E., 4,297,668, Cl. 337-365.000.

Thigpen, Ben B.; and Porter, James A., Jr., to Western Geophysical Company of America. Air-gun fire time sensor. 4,296,827, Cl. 181-107.000.

Thomas, Jeffrey R., to PQ Corporation. Drying of potassium silicate. 4,297,163, Cl. 159-48.00R.

Thompson, Bernard B., to Boeing Company, The. Brake torque limiter. 4,296,897, Cl. 244-111.000.

Thompson, Elmer R. Sewing machine conversion apparatus. 4,296,703, Cl. 112-310.000.

Thompson, Jerome B. English muffin, method and apparatus. 4,296,682, Cl. 99-426.000.

Thompson, Robert M., to Suntech, Inc. Manufacture of a block copolymer containing a polyetheramide and a polylactam. 4,297,454, Cl. 525-432.000.

Thomson-CSF: *See—*
Dupressoir, Albert, 4,297,710, Cl. 343-756.000.
Lacomme, Philippe, 4,297,703, Cl. 343-7.300.
Matherat, Philippe, 4,297,694, Cl. 340-750.000.

Thornton, Kenneth, to Rolls-Royce Motors Limited. Automatic transmission. 4,296,646, Cl. 74-688.000.

Thorpe, Cameron L.: *See—*
Hales, Marwood J.; and Thorpe, Cameron L., 4,296,602, Cl. 60-398.000.

Thyssen Aktiengesellschaft vormals August Thyssen-Hutte: *See—*
Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.

Thyssen Industrie AG: *See—*
Kronert, Curt, 4,296,853, Cl. 192-106.100.

Tikhonov, Valentin N.: *See—*
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.

Tilgner, Leopold: *See—*
Loser, Norbert; and Tilgner, Leopold, 4,296,978, Cl. 308-37.000.

Timex Corporation: *See—*
Bissar, Saadi, 4,297,006, Cl. 350-357.000.
Ho, Kok-Kit, 4,296,532, Cl. 24-206.00R.

TME, Inc.: *See—*
Jesse, Harold W.; and Jones, Peter M., 4,297,522, Cl. 174-36.000.

Toda, Tosifusa: *See—*
Ohashi, Mochihiko; and Toda, Tosifusa, 4,297,198, Cl. 204-299.00R.

Tokico Ltd.: *See—*
Tamura, Koichi; and Haraikawa, Tetsuo, 4,296,844, Cl. 188-73.380.

Tokunaga, Shinobu; and Shiina, Yuichi, to Sumita Optical Glass Manufacturing Co., Ltd. Optical glass for optical paths. 4,297,141, Cl. 501-67.000.

Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
Tsuda, Minoru; and Nakamura, Yoichi, 4,297,433, Cl. 430-270.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.
Iwai, Michinobu; and Tanimoto, Akira, 4,297,555, Cl. 200-153.00G.
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, 4,297,553, Cl. 200-145.000.
Kimura, Takashi, 4,297,597, Cl. 307-315.000.
Okatsuka, Hisahi, 4,297,568, Cl. 235-435.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Anezaki, Yoshimitsu, 4,297,612, Cl. 313-446.000.

Tolliver, Wilbur E. Pipe joint seal. 4,296,933, Cl. 277-34.300.

Tom, M. Dale. Water detection device. 4,297,686, Cl. 340-604.000.

Tomimura, Eijiro: *See—*
Mise, Yoshinari; and Tomimura, Eijiro, 4,297,146, Cl. 127-60.000.

Tommaney, Joseph W.: *See—*
Patil, Balaji V.; and Tommaney, Joseph W., 4,297,132, Cl. 75-10.00V.

Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., to General Foods Corporation. Frozen aerated ready-to-eat gelatin composition. 4,297,379, Cl. 426-565.000.

Toray Industries, Inc.: *See—*
Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, 4,297,187, Cl. 204-165.000.
Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, 4,297,477, Cl. 528-323.000.

Torgersen, Jan H.: *See—*
Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.

Torii, Takahiro: *See—*
Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, 4,296,948, Cl. 282-27.500.

Total Oil Great Britain Limited: *See—*
Shackcloth, Barry, 4,297,543, Cl. 200-18.000.

Tourdot, Jacques: *See—*
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, 4,297,298, Cl. 260-502.00R.

Tournier, Claude. Skinning machine for the heads and limbs of slaughtered animals. 4,296,526, Cl. 17-21.000.

Tournier, Edmond: *See—*
Laval, Michel; and Tournier, Edmond, 4,297,576, Cl. 250-336.000.

Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., to Tweco Products, Inc. Semi-automatic welding gun. 4,297,561, Cl. 219-137.630.

Toyo Jozo Kabushiki Kaisha: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.

Toyo Kogyo Co., Ltd.: *See—*
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, 4,296,719, Cl. 123-198.00F.

Toyo Pulp Co. Ltd.: *See—*
Kinbara, Koichi; Sugimoto, Norimaro; and Nakazawa, Toshitaka, 4,297,402, Cl. 428-35.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Tsuboi, Akira; and Kato, Shiro, 4,296,541, Cl. 29-568.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Kizaki, Jiro; and Fujii, Takashi, 4,296,604, Cl. 60-562.000.
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.
Okano, Hiroshi; and Sato, Akira, 4,296,648, Cl. 74-798.000.
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.

Travis, Karen L.: *See—*
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., 4,297,337, Cl. 424-1.000.

Treczka, Leo, to Spinner GmbH Elektrotechnische Fabrik. 3dB Waveguide directional coupler. 4,297,658, Cl. 333-113.000.

Tregurtha, Steven J.; and Cryer, Edward, to Lucas Industries Limited. Direction indicator switch. 4,297,549, Cl. 200-61.270.
Trepka, William J., to Phillips Petroleum Co. Orthoesters as coupling agents for producing monovinylarene homopolymers. 4,297,464, Cl. 526-181.000.
Trico Products Corporation: *See*—
Mower, Peter, 4,296,521, Cl. 15-250.320.
Trinh, Stephane: *See*—
Guigues, Francois; and Trinh, Stephane, 4,297,367, Cl. 424-283.000.
Trio Kabushiki Kaisha: *See*—
Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,297,601, Cl. 307-555.000.
Triumph-Werke Nurnberg A.G.: *See*—
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Trocciola, John C.: *See*—
Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., 4,297,419, Cl. 429-44.000.
Trochoid Power Corporation: *See*—
Hoffmann, Ralph M., 4,297,090, Cl. 418-61.00A.
Trotzek, Gunter: *See*—
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, 4,297,044, Cl. 400-473.000.
True Temper Corporation: *See*—
Luebke, Robert W., 4,296,884, Cl. 238-2.000.
Trutna, William R., Jr., to Leland Stanford University, Board of Trustees of. Multipath Raman cell for wavelength conversion. 4,297,600, Cl. 307-426.000.
TRW Inc.: *See*—
Zehren, James N., 4,296,548, Cl. 29-871.000.
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., to Gulf Research & Development Company. In situ gasification of bituminous coal. 4,296,809, Cl. 166-259.000.
Tschunt, Edgar: *See*—
Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.
Tsubai, Yasuo: *See*—
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,429, Cl. 430-204.000.
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,430, Cl. 430-204.000.
Tsuboi, Akira; and Kato, Shiro, to Toyoda Koki Kabushiki Kaisha. Tool storage magazine for a machine tool. 4,296,541, Cl. 29-568.000.
Tsuchiya, Tsutomu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.
Tsuchiya, Yoshimi; Sagae, Masayuki; and Mizutani, Hiroshi, to Kao Soap Co., Ltd. Absorbent material. 4,297,410, Cl. 428-283.000.
Tsuda, Minoru; and Nakamura, Yoichi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Light sensitive compositions of polymethyl isopropenyl ketone. 4,297,433, Cl. 430-270.000.
Tsukahara, Hirokazu: *See*—
Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, 4,296,948, Cl. 282-27.500.
Tsutsui, Kotaroh; and Kinugawa, Ryoji, to Alps Electric Co., Ltd. Interlocking gang push-button switch. 4,297,540, Cl. 200-5.00B.
Tsypina, Zinaida D.: *See*—
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.
Tucker, Trevor W.; and Cornish, William D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Microwave frequency division by phase locked loops. 4,297,648, Cl. 331-1.00R.
Tunashima, Seiichi: *See*—
Ito, Isao; and Tunashima, Seiichi, 4,297,034, Cl. 356-394.000.
Tuominen, Pertti: *See*—
Uusitalo, Leo; and Tuominen, Pertti, 4,297,067, Cl. 414-114.000.
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., to International Nickel Co., Inc., The. Battery and electrolytic cell electrodes. 4,297,421, Cl. 429-225.000.
Turpin, Daniel: *See*—
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.
Tweco Products, Inc.: *See*—
Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., 4,297,561, Cl. 219-137.630.
Tyler, Hugh J.; and Conway, William H., to Robertshaw Controls Company. Microwave oven temperature indicator and control means. 4,297,557, Cl. 219-10.55R.
Tylo Sauna S.A.: *See*—
Janson, Mats O., 4,296,507, Cl. 4-524.000.
Tyo, James H., to Camp International, Inc. Convertible parapodium. 4,296,761, Cl. 128-80.00G.
Ube Industries, Ltd.: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Uchidoi, Masanori: *See*—
Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,297,013, Cl. 354-23.00D.
Uchiyama, Yoshihiro: *See*—
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.
Ucinhazska, Bruno: *See*—
Norden, Jurgen; and Ucinhazska, Bruno, 4,296,885, Cl. 239-1.000.
Ueda, Hiroshi: *See*—
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Ueda, Nobuo: *See*—
Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, 4,297,166, Cl. 376-194.000.
Uemura, Hiroshi: *See*—
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, to Ube Industries, Ltd. Method for polymerizing α-olefin. 4,297,463, Cl. 526-128.000.
Uerlichs, Johannes: *See*—
Muller, Rudolf; Lengsfeld, Franz; and Uerlichs, Johannes, 4,296,770, Cl. 137-340.000.
Uhrig, Heinz; and Deubel, Reinhold, to Hoechst Aktiengesellschaft. Manufacture and use of non-ionogenic interface-active agents based on modified rosins. 4,297,270, Cl. 260-104.000.
Umaba, Toshikatsu: *See*—
Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, 4,297,248, Cl. 252-477.00R.
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Production of a selectively protected N-acylated derivative of an aminoglycosidic antibiotic. 4,297,485, Cl. 536-10.000.
Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.
Union Carbide Corporation: *See*—
Bryant, David R.; and Galley, Richard A., 4,297,239, Cl. 252-412.000.
Chiasson, Bertrand A., 4,297,509, Cl. 562-456.000.
Davis, Robert B., 4,296,610, Cl. 62-55.000.
Hsu, Fu-Tong; and Kantz, John F., 4,296,860, Cl. 206-386.000.
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,297,241, Cl. 252-435.000.
Kilinskas, William A.; Selines, Ronald J.; and Vand den Sype, Jaak S., 4,296,512, Cl. 10-27.00E.
Koleske, Joseph V., 4,297,476, Cl. 528-300.000.
Lok, Brent M. T.; and Izod, Thomas J. P., 4,297,335, Cl. 423-328.000.
Nunciato, David J.; White, Norman H.; and Woodburn, William A., 4,297,147, Cl. 134-7.000.
Ritscher, James S.; and Sandner, Michael R., 4,297,328, Cl. 423-213.200.
Sigmund, Paul W.; and Butwell, Kenneth F., 4,297,329, Cl. 423-228.000.
Taylor, Gordon J., 4,297,307, Cl. 264-29.500.
Union Oil Company of California: *See*—
Moorehead, Eric L., 4,297,243, Cl. 252-455.00Z.
United Chemi-Con, Inc.: *See*—
Dyer, Christopher K., 4,297,184, Cl. 204-129.400.
United Kingdom Atomic Energy Authority: *See*—
Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., 4,297,246, Cl. 252-465.000.
United States Borax & Chemical Corporation: *See*—
Speak, Richard C.; and Ferm, Donald J., 4,297,229, Cl. 252-109.000.
United States of America
Agriculture: *See*—
Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, 4,297,125, Cl. 71-77.000.
Air Force: *See*—
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., 4,297,152, Cl. 149-88.000.
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., 4,297,510, Cl. 564-13.000.
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Boothe, Robert R., 4,297,705, Cl. 343-771.000.
Concha, Edward; Jaffe, Max; and Bedford, Riley, 4,297,068, Cl. 414-458.000.
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.
Garrett, Harold E., 4,296,687, Cl. 102-518.000.
Monte, Anthony J., 4,296,817, Cl. 169-62.000.
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Claffy, Richard D.; and Lovelace, Reginald B., 4,296,771, Cl. 137-110.000.
Dittman, Charles C.; and St. Clair, Richard C., 4,297,622, Cl. 318-254.000.
Hardesty, Thomas K. C., 4,296,689, Cl. 102-260.000.
Temple, Paul A., 4,297,032, Cl. 356-366.000.
Wooden, Bruce J.; and Edelman, Seymour, 4,297,394, Cl. 427-100.000.
U.S. Philips Corporation: *See*—
Buchner, Robert B., 4,297,536, Cl. 179-170.00D.
Cassel, Knut E.; and Molin, Bengt T., 4,297,709, Cl. 343-754.000.
Goerth, Joachim, 4,297,654, Cl. 331-108.00D.
Goudin, Robert, 4,296,753, Cl. 128-660.000.
Herzner, Karl H., 4,297,567, Cl. 235-92.0PB.
Matthijsse, Matthijs, 4,296,906, Cl. 248-280.100.
Melwisch, Harald; and Looren de Jong, Hendrikus, 4,297,731, Cl. 360-70.000.
Sanderson, Hendrik J., 4,297,733, Cl. 360-77.000.

Severijns, Adrianus P.; and Staas, Frans A., 4,296,609, Cl. 62-514.00R.

United States Steel Corporation: *See*—
Bray, Lynn W., 4,296,556, Cl. 34-107.000.

United Technologies Corporation: *See*—
Krauss, Timothy A.; and Roman, Stephan, 4,297,080, Cl. 416-141.000.
Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., 4,297,419, Cl. 429-44.000.

University of California, The Regents of the: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,297,637, Cl. 324-309.000.
Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, 4,297,615, Cl. 315-111.210.

University of Illinois Foundation: *See*—
Waller, Donald P.; Zaneveld, Lourens J. D.; and Fong, Harry H. S., 4,297,341, Cl. 424-80.000.

University of Melbourne, The: *See*—
McCutchan, John C.; and Niven, Rex C., 4,297,633, Cl. 324-51.000.

University of Surrey: *See*—
Hannaht, David J., 4,297,409, Cl. 428-247.000.

Upjohn Company, The: *See*—
Babcock, John C.; Campbell, J. Allan; and Lobl, Thomas J., 4,297,350, Cl. 424-238.000.
Craven, Richard L., 4,297,339, Cl. 424-19.000.
Nelson, Stephen J., 4,297,285, Cl. 260-346.730.
Sih, John C., 4,297,504, Cl. 560-119.000.

Ura, Hiroaki: *See*—
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Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., to Phillips Petroleum Company. Dienyllithium initiated polymers. 4,297,451, Cl. 525-366.000.

Url, Karlheinz; and von Basse, Paul W., to Siemens Aktiengesellschaft. Integratable dynamic current source for semiconductor modules. 4,297,592, Cl. 307-583.000.

Urui, Kiyoshi: *See*—
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.

Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, to Bridgestone Tire Co., Ltd. Pneumatic marine fender. 4,296,705, Cl. 114-219.000.

Usardi, Maria M.: *See*—
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USM Corporation: *See*—
Halford, David W.; Price, Frank C.; and Bosworth, George H., 4,296,513, Cl. 12-12.000.
Netzsch, Hermann, 4,297,560, Cl. 219-130.010.
Valks, Robert K., 4,296,614, Cl. 69-48.000.

Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, to Nippon Kogaku K.K. Focus detecting device. 4,297,571, Cl. 250-201.000.

Uusitalo, Leo; and Tuominen, Pertti, to Outokumpu Oy. Method and apparatus for handling packed layers of support rods in an electrolytic refining plant. 4,297,067, Cl. 414-114.000.

Vadetec Corporation: *See*—
Kemper, Yves J., 4,296,647, Cl. 74-690.000.

Vail, Ande. Power supply system. 4,297,590, Cl. 307-43.000.

Valks, Robert K., to USM Corporation. Leather press. 4,296,614, Cl. 69-48.000.

Valli & Colombo S.p.A.: *See*—
Colombo, Angelo, 4,296,956, Cl. 292-169.180.

Van Broekhoven, Johannes A. M.; and Drent, Eit, to Shell Oil Company. Preparation of carbonyl compounds from allylethers. 4,297,517, Cl. 568-361.000.

Vand den Sype, Jaak S.: *See*—
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van der Lely, Cornelis. Vehicle having bogie mounted wheels. 4,296,826, Cl. 180-24.000.

van der Lugt, Arie, to Gist-Brocades N.V. Closure treatment machine. 4,296,769, Cl. 134-68.000.

Vanlerberghe, Guy; and Sebag, Henry, to L'Oreal. Cyclical tensio-active polyethers. 4,297,102, Cl. 8-406.000.

Vann, William P.: *See*—
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., 4,297,337, Cl. 424-1.000.

Van Uitert, LeGrand G.: *See*—
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,297,005, Cl. 350-357.000.

Van Vliet, Raymond A., to Weyerhaeuser Company. Method for application of elastic to articles. 4,297,157, Cl. 156-164.000.

Van Wassenhove, Bernard, to CMI Corporation. Folding gooseneck assembly. 4,296,941, Cl. 280-423.00B.

van Zorge, Jacob A., to ACF Chemiefarma NV. Anti-ulcer compositions containing certain pyridyl oxime ethers. 4,297,359, Cl. 424-263.000.

Varel Manufacturing Company: *See*—
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Vartoukian, Artin G., to Singer Company, The. Fabric clamp. 4,296,699, Cl. 112-121.150.

Vcelka, John L.: *See*—
Muetterties, Andrew J.; Vcelka, John L.; and Kelsey, Wayne R., 4,296,949, Cl. 285-18.000.

VDO Adolf Schindling AG: *See*—
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Verable, Diara; and Gibson, Willie M. Automobile shed. 4,296,575, Cl. 52-66.000.

Verbicky, John W., to General Electric Company. Chlorination of phthalic anhydride. 4,297,283, Cl. 260-346.300.

Verdier, Jean-Pierre: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.

Vetter, Artur, to Multivac Sepp Haggenmuller KG. Sealing station of vacuum packaging machines. 4,296,588, Cl. 53-86.000.

Vickers Limited: *See*—
Rogers, Stanley J. C.; and Taplin, John F., 4,296,983, Cl. 312-263.000.

Vidal, Paul, to Societe d'Etude du Radant. Apparatus and methods for correcting dispersion in a microwave antenna system. 4,297,708, Cl. 343-754.000.

Viehrig, Wolfgang: *See*—
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.

Vik, Bjarne: *See*—
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Vilicich, John: *See*—
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Vinson, Joseph J. Reversible garment. 4,296,498, Cl. 2-115.000.

Virginia Panel Corporation: *See*—
Stowers, Jeffery P.; and Stowers, Kimball E., 4,296,990, Cl. 339-128.000.

Vitello, John P.; and Grummon, Glenn D., to Mallinckrodt, Inc. System for generating and containerizing radioisotopes. 4,296,785, Cl. 141-105.000.

Vockenhuber, Karl: *See*—
Freudenschuss, Otto, 4,297,732, Cl. 360-72.100.

Vogel, Ignaz. Passenger seat. 4,296,967, Cl. 297-451.000.

Vogt, Alfred, to Hoval Interliz AG. Two-chamber boiler for burner firing and solid fuel firing. 4,296,712, Cl. 122-22.000.

Vogt, Frederick G., deceased (by Vogt, Mary J., executrix); and Sparrell, Patricia T., to Betz Laboratories, Inc. Low level chromate-based corrosion inhibition in aqueous mediums. 4,297,317, Cl. 422-16.000.

Vogt, Mary J., executrix: *See*—
Vogt, Frederick G., deceased; and Sparrell, Patricia T., 4,297,317, Cl. 422-16.000.

Voirol, Felix: *See*—
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,296,801, Cl. 165-104.170.

Voisin, Norbert: *See*—
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Volkswagenwerk AG: *See*—
Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,296,732, Cl. 126-426.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Hofbauer, Peter; Willmann, Michael; and Wundrak, Egon, 4,296,716, Cl. 123-195.00C.
Oberpichler, Gerd; and Honig, Ernst-August, 4,296,652, Cl. 74-868.000.

von Basse, Paul W.: *See*—
Url, Karlheinz; and von Basse, Paul W., 4,297,592, Cl. 307-583.000.

von der Eltz, Hans-Ulrich; Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the dyeing of synthetic polyamide fibers with reactive dyes according to the batchwise exhaustion method. 4,297,101, Cl. 8-531.000.

von Petery, Curt, to Gutehoffnungshutte Sterkrade A.G. Positive control system for piston compressor valves. 4,297,083, Cl. 417-53.000.

Vormbrock, Rolf; and Helger, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Hemolysing solution preparing hemolysed blood having a stabilized glucose content. 4,297,238, Cl. 252-408.000.

Vought Corporation: *See*—
Krall, Kenneth M., 4,296,900, Cl. 244-219.000.

Vuyovich, John M. Piston top-dead-center detector. 4,296,629, Cl. 73-116.000.

W. Hegenscheidt Gesellschaft mbH: *See*—
Bagusche, Siegfried, 4,296,620, Cl. 72-100.000.

W. R. Grace & Co.: *See*—
Jachimowicz, Felek, 4,297,481, Cl. 528-392.000.
Wood, Louis L.; and Larsen, Donald W., 4,297,482, Cl. 528-405.000.

Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, to Hitachi, Ltd.; and Trio Kabushiki Kaisha. Monostable multivibrator circuit and FM detector circuit employing predetermined load resistance and constant current to increase response rate of differential transistor pair. 4,297,601, Cl. 307-555.000.

Wade, David R.; and Munch, Walter, to Baldwin Piano & Organ Company. Capture combination action system for electronic organs. 4,296,667, Cl. 84-345.000.

Waghorn, Peter E.: *See*—
Stead, John C.; and Waghorn, Peter E., 4,297,408, Cl. 428-240.000.

Wagner Electric Corporation: *See*—
Cortorillo, Salvatore F., 4,297,611, Cl. 313-222.000.

Wagner, Kuno: *See*—
Reischl, Artur; and Wagner, Kuno, 4,297,456, Cl. 525-452.000.

Wagstaff, Robert A.: *See*—
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., 4,296,591, Cl. 56-10.300.

Wah Ming Electrics Limited: *See*—
Tak, Shiu M., 4,297,605, Cl. 310-242.000.

Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor), to Plastics Engineering Company. Polymerization products of polyimide derivatives having unsaturated terminal amide groups. 4,297,467, Cl. 526-259.000.

Wakisaka, Hiroshi: *See*—
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.

Wakushima, Yoshikazu: *See*—
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.

Waldrop, T. William; and Campbell, Willis R., to Sperry Corporation. Automatic bale ejection drive. 4,296,596, Cl. 56-341.000.

Wall, Berth-Ove G.: *See*—
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,296,633, Cl. 73-362.0AR.

Wallace, Christopher B., to Bio-Group, Inc. Process for the biological degradation of organic-containing waste matter. 4,297,122, Cl. 71-12.000.

Waller, Donald P.; Zaneveld, Lourens J. D.; and Fong, Harry H. S., to University of Illinois Foundation. Spermicidal composition. 4,297,341, Cl. 424-80.000.

Walter Kidde & Company, Inc.: *See*—
Harshman, Ronald W and Dietrich, Lynn A., 4,296,773, Cl. 137-312.000.

Walter, Rolf: *See*—
Hildebrandt, Norbert; Becker, Norbert; Walter, Rolf; and Hoffman, Manfred, 4,296,981, Cl. 312-194.000.

Walther, Gerhard: *See*—
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., 4,297,354, Cl. 424-248.510.

Wang, An, to Wang Laboratories, Inc. Helical print head mechanism. 4,297,042, Cl. 400-163.200.

Wang Laboratories, Inc.: *See*—
Wang, An, 4,297,042, Cl. 400-163.200.

Wangermann, Jochen, to Gruner & Jahr AG & Co. Apparatus for stacking folded printing products. 4,296,684, Cl. 100-292.000.

Wankel, Felix. Seal mechanism for the rotor periphery of a rotary piston engine. 4,296,936, Cl. 277-81.00P.

Ward, Franklin D.; and Engeman, Rock A. Surfboard carrier. 4,296,878, Cl. 224-32.00A.

Ward, Herbert J.; Dobbie, Derek J.; and Lyall, Brian, to British Cellophane Limited. Heat-sealable polypropylene films. 4,297,415, Cl. 428-516.000.

Warner, Gary N., to AMP Incorporated. Connector with improved terminal support. 4,296,988, Cl. 339-97.00R.

Watanabe, Hideo: *See*—
Welsh, Luther; Bergquist, Daryl J.; and Watanabe, Hideo, 4,296,752, Cl. 128-635.000.

Watanabe Instruments Corp.: *See*—
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.

Watanabe, Yuichi: *See*—
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.

Watson, Ronald S. Anchor device for propeller rotator. 4,296,898, Cl. 244-115.000.

Wavin B.V.: *See*—
Nicholas, Terry G., 4,297,053, Cl. 405-121.000.

Wayt, Newell E. Gas anchor. 4,297,084, Cl. 417-179.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Jardin, Hans; and Hirschberger, August, 4,296,962, Cl. 296-217.000.

Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., to Sperry - New Holland. Universal crop divider mechanism. 4,296,593, Cl. 56-98.000.

Webb, Gerald F., to Northern Telecom Limited. Modular telephone jack. 4,297,529, Cl. 179-1.0PC.

Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., to Boehringer Ingelheim GmbH. Substituted 4-amino-2,6-diaryl-tetrahydrothiopyrans and salts thereof, and use as antidepressants. 4,297,354, Cl. 424-248.510.

Webster, Emmett G.: *See*—
Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., 4,296,593, Cl. 56-98.000.

Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Arrangement for cooling the rotor of an electric machine with a superconducting field winding. 4,297,603, Cl. 310-53.000.

Weil, Edward D., to Stauffer Chemical Company. Copolycondensation products of β-haloalkyl phosphates and dialkyl phosphonates. 4,297,138, Cl. 106-18.180.

Weiler, Ernest D.: *See*—
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,297,342, Cl. 424-84.000.

Weinar, Roger N. Wall constructed from panels held in position with the aid of concealed fasteners and concealable fasteners for use in assembling such wall. 4,296,580, Cl. 52-281.000.

Weiner, Milton L., to Mobil Oil Corporation. Heat sealable packaging film comprising propylene polymer substrate and a surface layer of an ethylene copolymer and a different olefin copolymer. 4,297,411, Cl. 428-347.000.

Weinmann, Ernst: *See*—
Bohn, Hans; and Weinmann, Ernst, 4,297,343, Cl. 424-85.000.

Weir, William D.: *See*—
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,297,342, Cl. 424-84.000.

Weiss, Richard: *See*—
Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, 4,297,099, Cl. 8-484.000.

Welch, Melvin B.: *See*—
McDaniel, Max P.; and Welch, Melvin B., 4,297,460, Cl. 526-98.000.

Weller, Alois; and Mai, Wolfgang, to Kieserling & Albrecht. Crank press with lateral rod ejector. 4,296,625, Cl. 72-345.000.

Wellington, Roger D., to Augat Inc. Electrical contact with improved means for solder wicking and degassing. 4,296,993, Cl. 339-275.00B.

Wells, Bruce D.: *See*—
McConomy, Thomas A.; and Wells, Bruce D., 4,297,334, Cl. 423-321.00R.

Welsh, Luther; Bergquist, Daryl J.; and Watanabe, Hideo, to Johnson & Johnson. Transcutaneous oxygen sensor with adjacent heater. 4,296,752, Cl. 128-635.000.

Werner, Peter; Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, to Robert Bosch GmbH. Circuit arrangement for obtaining an interference-free trigger signal especially for a fuel apportionment device in an internal combustion engine. 4,297,599, Cl. 307-355.000.

Werner Weber Holding AB: *See*—
Stranders, Roelof J., 4,296,958, Cl. 294-27.00H.

Werner, Wolfgang: *See*—
Guthlein, Werner; Wielinger, Hans; Rittersdorf, Walter; and Werner, Wolfgang, 4,297,271, Cl. 260-107.000.

Wernicke, Hans J.: *See*—
Schliebener, Claus; and Wernicke, Hans J., 4,297,204, Cl. 208-95.000.

Wess, Beatrice M. Skin moisturizing and cleansing cream. 4,297,374, Cl. 424-364.000.

Wessling, Diether, to Bayer Aktiengesellschaft. Process for halogenating copper phthalocyanine. 4,297,281, Cl. 260-314.500.

West Company, The: *See*—
Brignola, Dominic J., 4,296,786, Cl. 141-309.000.

Western Electric Co., Inc.: *See*—
Garrett, Robert W., 4,297,190, Cl. 204-192.00E.

Western Geophysical Company of America: *See*—
Thigpen, Ben B.; and Porter, James A., Jr., 4,296,827, Cl. 181-107.000.

Westinghouse Air Brake Company: *See*—
Housman, Richard J., 4,296,868, Cl. 213-50.000.

Westinghouse Electric Corp.: *See*—
Chen, Cheng-Lin, 4,297,191, Cl. 204-193.000.
Durgin, George A.; and Demers, Daniel E., 4,297,077, Cl. 416-97.00R.
Gupta, Tapan K.; and Pietsch, Herbert E., 4,297,250, Cl. 252-518.000.
Hagberg, John E., 4,297,740, Cl. 361-67.000.
Seidel, Martin P., 4,297,254, Cl. 260-18.0EP.
Wolfe, Donald L.; Modglin, Donald D.; and Merrick, George J., 4,297,061, Cl. 409-131.000.

Westland Aircraft Limited: *See*—
Martin, Alfred C., 4,297,078, Cl. 416-134.00A.

Wettstein, Ernest C.: *See*—
Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., 4,297,388, Cl. 427-47.000.

Weyerhaeuser Company: *See*—
Lee, Peter F., 4,297,164, Cl. 162-60.000.
Van Vliet, Raymond A., 4,297,157, Cl. 156-164.000.

Whaley, Ralph D.: *See*—
Larson, Roderick W.; and Whaley, Ralph D., 4,296,989, Cl. 339-99.00R.

Wheelabrator-Frye Inc.: *See*—
Leliaert, Raymond M., 4,296,794, Cl. 164-131.000.

Whitby, Clyde M., to Singer Company, The. Wide angle laser display system. 4,297,723, Cl. 358-60.000.

White, Norman H.: *See*—
Nunciato, David J.; White, Norman H.; and Woodburn, William A., 4,297,147, Cl. 134-7.000.

White, Pat M.: *See*—
Hendrickson, James D.; and White, Pat M., 4,296,807, Cl. 166-184.000.

Whiteside, George D.: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,297,016, Cl. 354-27.000.

Whitman, Hobart A., III, to Olin Corporation. Apparatus for controlled perforation of moving webs with fixed focus laser beam. 4,297,559, Cl. 219-121.0LB.

Wichmann, Arnold, to Kraftwerk Union Aktiengesellschaft. Method of bracing end turns of an electric machine by means of a binding band; and device used therein. 4,297,606, Cl. 310-271.000.

Wickmann Werke AG: *See*—
Asdollahi, Nasrollah, 4,297,666, Cl. 337-163.000.

Widen, Bo G., to GKN-Stenman AB. Anchoring means for door lock plates. 4,296,619, Cl. 70-451.000.

Wiehler, Wolf: *See*—
Gross, Franz; Boehme, Gerit; Wiehler, Wolf; and Bibracher, Wilhelm, 4,297,662, Cl. 333-252.000.

Wielinger, Hans: *See*—
Guthlein, Werner; Wielinger, Hans; Rittersdorf, Walter; and Werner, Wolfgang, 4,297,271, Cl. 260-107.000.

Wil-Rich, Inc.: *See*—
Quanbeck, Sherman H., 4,296,695, Cl. 111-34.000.
Wilcox, Brian N.; and Robinson, John W., to Kimball International, Inc. Solo sustain keyer system. 4,296,666, Cl. 84-1.260.
Wilder, Gene R.: *See*—
Merten, Helmut L.; and Wilder, Gene R., 4,297,269, Cl. 260-45.9QB.
Wiley, David: *See*—
Nicol, Thomas; Wiley, David; and Allport, Maurice J., 4,297,631, Cl. 320-64.000.
Will, Norbert F.: *See*—
Puch, Diethelm; and Will, Norbert F., 4,297,040, Cl. 400-144.200.
Willburger, Nikolaus: *See*—
Brunner, Anton; and Willburger, Nikolaus, 4,297,707, Cl. 343-725.000.
Willenbacher, Erich: *See*—
Jehle, Fritz; and Willenbacher, Erich, 4,296,700, Cl. 112-153.000.
Williams, Frank J., III; and Relles, Howard M., to General Electric Company. Polyetherimides prepared by self-condensation of hydroxyaryl phthalimide salts. 4,297,474, Cl. 528-170.000.
Williams, Meurig W.; and AuClair, Christopher J., to Xerox Corporation. Polyblend coated carrier materials. 4,297,427, Cl. 430-108.000.
Willman, Bertram T., to Exxon Production Research Company. Thermal recovery of viscous hydrocarbons using arrays of radially spaced horizontal wells. 4,296,969, Cl. 299-2.000.
Willmann, Michael: *See*—
Hofbauer, Peter; Willmann, Michael; and Wundrak, Egon, 4,296,716, Cl. 123-195.00C.
Wilmarth, Paul C.: *See*—
Nicholson, John E.; and Wilmarth, Paul C., 4,297,726, Cl. 358-254.000.
Wilson, John C.: *See*—
Woon, Lin-Sun; and Wilson, John C., 4,296,750, Cl. 128-287.000.
Wilson, Kermit H.; and Carlson, Ronald R., to Sico Incorporated. Audience control barrier. 4,296,573, Cl. 52-6.000.
Winchester, Loren R. Inflatable camper. 4,296,960, Cl. 296-167.000.
Winner, Stephen E.: *See*—
Patterson, Theodore P.; and Winner, Stephen E., 4,296,499, Cl. 2-239.000.
Wippich, Rheinhold: *See*—
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Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., 4,297,289, Cl. 260-397.200.
Wissner, Allan, to American Cyanamid Company. 1-Substituted-1-oxo-prostane-derivatives of the E, A and F series. 4,297,516, Cl. 568-330.000.
Witte, Arnold C.; and Coleman, Richard L., to Texaco Inc. Method for continuous grease manufacture. 4,297,227, Cl. 252-18.000.
Wolfe, Donald L.; Modglin, Donald D.; and Merrick, George J., to Westinghouse Electric Corp. Steam generator shell parting method and apparatus. 4,297,061, Cl. 409-131.000.
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, to Degussa Aktiengesellschaft. Silane/filler preparations, process for their production and their use. 4,297,145, Cl. 106-308.00Q.
Wolinski, Leon E.; and Berezuk, Peter D., to Pratt & Lambert, Inc. Non-toxic activators for adhesive compositions. 4,297,158, Cl. 156-305.000.
Wollny, Klaus: *See*—
Hendricks, Udo-Winfried; and Wollny, Klaus, 4,297,103, Cl. 8-534.000.
Wood, Louis L.; and Larsen, Donald W., to W. R. Grace & Co. Chain-extended polyol compositions and method. 4,297,482, Cl. 528-405.000.
Wood, Robert C.: *See*—
Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M., 4,297,303, Cl. 264-3.00R.
Woodburn, William A.: *See*—
Nunciato, David J.; White, Norman H.; and Woodburn, William A., 4,297,147, Cl. 134-7.000.
Woodcock, Sidney J.: *See*—
Shah, Siddharth A.; Woodcock, Sidney J.; and Fagan, Robert D., 4,297,072, Cl. 414-684.300.
Wooden, Bruce J.; and Edelman, Seymour, to United States of America, Navy. Piezoelectric polymer antifouling coating and method of use and application. 4,297,394, Cl. 427-100.000.
Woodford, Donald L. Method and apparatus for making a non spherical beveled contact lens. 4,297,008, Cl. 351-177.000.
Woodhead, James L.: *See*—
Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., 4,297,246, Cl. 252-465.000.
Woolbright, Kenneth O. Sound broadcasting apparatus. 4,296,664, Cl. 84-1.030.
Wooldridge, Timothy A.: *See*—
Mundt, Randall S.; Wooldridge, Timothy A.; and Blasingame, Thomas O., 4,297,162, Cl. 156-643.000.
Woon, Lin-Sun; and Wilson, John C., to Kimberly-Clark Corporation. Refastenable pressure-sensitive tape closure system for disposable diapers and method for its manufacture. 4,296,750, Cl. 128-287.000.
World Wide Oil Tools, Inc.: *See*—
Keast, Larry G.; and Horton, Herbert D., 4,296,842, Cl. 188-61.000.
Worthington, Byron C. Chair carrier. 4,297,069, Cl. 414-462.000.
Wraige, Douglas: *See*—
Metcalfe, John L.; and Wraige, Douglas, 4,297,406, Cl. 428-215.000.
Wright, Joe B. Water ski with increased stability. 4,296,511, Cl. 9-310.00A.
Wright, Philip: *See*—
Coe, Charles D.; and Wright, Philip, 4,297,577, Cl. 250-343.000.
Wu, Che-Kuang, to Corning Glass Works. Photosensitive colored glasses exhibiting alterable photo-anisotropic effects. 4,297,417, Cl. 428-410.000.
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Decomposition of cumene hydroperoxide with a homogeneous catalyst. 4,297,518, Cl. 568-385.000.
Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Heat transfer system. 4,296,796, Cl. 165-46.000.
Wulff, B. James: *See*—
Day, Ralph R.; and Wulff, B. James, 4,296,917, Cl. 254-400.000.
Wundrak, Egon: *See*—
Hofbauer, Peter; Willmann, Michael; and Wundrak, Egon, 4,296,716, Cl. 123-195.00C.
Württembergische Metallwarenfabrik: *See*—
Schlegel, Hans; and Nowotny, Theodor, 4,297,175, Cl. 204-15.000.
Wurtz, Howard P.; and Peterson, Eugene W., to Hughes Aircraft Company. Vacuum gettering arrangement. 4,297,082, Cl. 417-51.000.
Wyse, Harold G.; and Smith, Millard S. Method and apparatus for producing a nitrate fertilizer. 4,297,123, Cl. 71-58.000.
Wyss, Clement R.: *See*—
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.
Xerox Corporation: *See*—
Carlson, Gerald E., 4,297,029, Cl. 355-133.000.
Corona, Stephen C., 4,297,616, Cl. 315-179.000.
Hewitt, Harvey J., 4,297,424, Cl. 430-58.000.
Marshall, Richard C., 4,297,695, Cl. 340-752.000.
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., 4,297,425, Cl. 430-58.000.
Scifres, Donald R.; and Stutius, Wolfgang E., 4,297,653, Cl. 331-94.50S.
Williams, Meurig W.; and AuClair, Christopher J., 4,297,427, Cl. 430-108.000.
Yabuki, Yoshiharu: *See*—
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, 4,297,440, Cl. 430-505.000.
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, to Konishiroku Photo Industry Co., Ltd. Automatic film feeding apparatus for photographic camera. 4,297,019, Cl. 354-171.000.
Yakimenko, Valentin G.: *See*—
Goldin, Rodion G.; and Yakimenko, Valentin G., 4,297,739, Cl. 361-55.000.
Yamada, Keita. Method of recovering gold. 4,297,134, Cl. 75-118.00R.
Yamada, Shoji: *See*—
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,429, Cl. 430-204.000.
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,430, Cl. 430-204.000.
Yamada, Tsuguyoshi: *See*—
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Yamada, Tsuneo: *See*—
Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,297,601, Cl. 307-555.000.
Yamada, Yasuyuki; and Okuno, Youichi, to Canon Kabushiki Kaisha. View finder for single-lens reflex camera. 4,297,020, Cl. 354-225.000.
Yamagishi, Hideki: *See*—
Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, 4,297,187, Cl. 204-165.000.
Yamaguchi, Shingo: *See*—
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.
Yamamoto, Hiroshi: *See*—
Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,297,013, Cl. 354-23.00D.
Yamamoto, Kaneo. Process for making diazo photosensitive paper. 4,297,428, Cl. 430-169.000.
Yamamoto, Minoru; Tachikawa, Shiro; and Maeno, Hiroo, to Yamanouchi Pharmaceutical Co., Ltd. Memory enhancer containing 2-(7-indenyloxymethyl-morpholine. 4,297,356, Cl. 424-248.570.
Yamane, Hiroyuki: *See*—
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Yamamoto, Minoru; Tachikawa, Shiro; and Maeno, Hiroo, 4,297,356, Cl. 424-248.570.
Yanagida, Kiyoshi: *See*—
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.
Yanna, Andrew F. Heat generation and distribution system. 4,296,883, Cl. 237-59.000.
Yano, Takefumi: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Yao, Shi K.: *See*—
Smith, Elroy C., Jr.; and Yao, Shi K., 4,297,189, Cl. 204-192.0SP.

Yasinsky, Konstantin K.; Glazunov, Sergei G.; Ross, Jury N.; and Bykov, Igor D. Refractory suspension for making foundry moulds. 4,296,793, Cl. 164-24.000.

Yasuba, Shoichi; and Ito, Takaharu, to Okuma Machinery Works, Ltd. Method and apparatus for positioning work on a numerically controlled lathe. 4,296,657, Cl. 82-1.00C.

Yasuda, Naohiko; and Nakanishi, Eiji, to Ajinomoto Co., Inc. Imidazoledicarboxylic acid derivative. 4,297,279, Cl. 260-239.100.

Yasuda, Takeo: *See*—
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.

Yasuda, Toshio, to Elastoflon Inc. Compound for coating containing fluorocarbonpolymer and method for its manufacture. 4,297,447, Cl. 525-133.000.

Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, to Santa Fe International Corporation. Method of laying offshore pipeline from a reel carrying vessel. 4,297,054, Cl. 405-168.000.

Yokoi, Gunpei, to Nintendo Co., Ltd. Projecting-type shooting game apparatus. 4,296,931, Cl. 273-316.000.

Yokoi, Masatada: *See*—
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.

Yokoyama, Junichi: *See*—
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Yonetani, Kengo: *See*—
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Yonezu, Hiroo: *See*—
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Yoshida Iron Works Co., Ltd.: *See*—
Fujii, Kenji, 4,297,133, Cl. 75-53.000.

Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co. Ltd. Alkyl, alkenyl, and aryl substituted triazene compounds, their salts and production thereof. 4,297,096, Cl. 435-128.000.

Yoshida Kogyo K.K.: *See*—
Hakoi, Tsutomu, 4,296,547, Cl. 29-766.000.

Yoshida, Tomio: *See*—
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.

Yoshino Kogyosho Co., Ltd.: *See*—
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,297,306, Cl. 264-23.000.

Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, to Yoshino Kogyosho Co., Ltd. Neck orienting method of bottles of saturated polyester resins. 4,297,306, Cl. 264-23.000.

Young, Dennis: *See*—
Foster, Alan I.; Sims, Malcolm L.; and Young, Dennis, 4,297,150, Cl. 148-6.300.

Young, Harlow S.: *See*—
Harney, David L.; and Young, Harlow S., 4,297,377, Cl. 426-438.000.

Young, Kenneth A.: *See*—
Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., 4,297,561, Cl. 219-137.630.

Zadiraka, Allan J., to Babcock & Wilcox Company, The. Control system for a solar steam generator. 4,296,730, Cl. 126-421.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.

Zaneveld, Lourens J. D.: *See*—
Waller, Donald P.; Zaneveld, Lourens J. D.; and Fong, Harry H. S., 4,297,341, Cl. 424-80.000.

Zeeh, Bernd: *See*—
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.

Zehren, James N., to TRW Inc. Method for splicing an electrical cable. 4,296,548, Cl. 29-871.000.

Zeiringer, Rudolf: *See*—
Claassen, Peter; List, Helmut; and Zeiringer, Rudolf, 4,296,635, Cl. 73-730.000.

Zenith Radio Corporation: *See*—
Kiteley, Terence J., 4,297,619, Cl. 315-381.000.

Zervopoulos, Panagiotis. Masonry cleaning process and composition. 4,297,148, Cl. 134-3.000.

Zhestkov, Vitaly I.: *See*—
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.

Zimmerly, Robert D., to Ladish Co. Spheroidal interconnector for filtration modules. 4,296,951, Cl. 285-95.000.

Zobel, Henry F.: *See*—
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.

Zoecon Corp.: *See*—
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Zoor, Reinhold, to Heinrich Wunder KG. Anti-theft arrangement, particularly for a mast of a sailing craft. 4,296,615, Cl. 70-19.000.

Zuern, Ludwig: *See*—
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.

Zydzik, George J.: *See*—
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,297,005, Cl. 350-357.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bollert, Ulrich: *See*—
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Bridges, Ronald P. Group operated circuit disconnect apparatus for overhead electric power lines. Re. 30,784, Cl. 200-48.0KB.

Calfee, Richard W.: *See*—
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., Re. 30,785, Cl. 364-200.000.

Finke, Manfred: *See*—
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Herwig, Walter: *See*—
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Hileman, Russell K.: *See*—
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., Re. 30,785, Cl. 364-200.000.

Hoechst Aktiengesellschaft: *See*—
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, to Hoechst Aktiengesellschaft. Flame retarding linear polyesters and shaped articles thereof. Re. 30,783, Cl. 528-287.000.

Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., to Zentec Corporation. Microcomputer terminal system. Re. 30,785, Cl. 364-200.000.

Minnesota Mining and Manufacturing Company: *See*—
van Turnhout, Jan, Re. 30,782, Cl. 264-22.000.

van Turnhout, Jan, to Minnesota Mining and Manufacturing Company. Method for the manufacture of an electret fibrous filter. Re. 30,782, Cl. 264-22.000.

Zentec Corporation: *See*—
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., Re. 30,785, Cl. 364-200.000.

LIST OF DESIGN PATENTEES

Advertising Displays Corporation: *See*—
Marks, Philip, 261,479, Cl. D9-341.000.

Affiliated Hatch and Sunroof, Inc.: *See*—
Butler, James P., 261,500, Cl. D12-191.000.

Albert, Ramon R. Sofa. 261,451, 10-27-81, Cl. D6-63.000.

Alessandrini, Anna M.: *See*—
Alessandrini, Paul P.; and Alessandrini, Anna M., 261,467, Cl. D7-74.000.

Alessandrini, Paul P.; and Alessandrini, Anna M. Combined knife set and rack. 261,467, 10-27-81, Cl. D7-74.000.

Appel, Mel; and Means, Paul B., III, to Appel, Mel. Combined toy bucket and tools therefor. 261,540, 10-27-81, Cl. D21-120.000.

Appel, Mel; and Kress, George, to Appel, Mel. Combined toy bucket and tools therefor. 261,541, 10-27-81, Cl. D21-120.000.

Baus, Andre E. J.; and Pair, Robert E. L. A., to Goodyear Tire & Rubber Company, The. Tire. 261,493, 10-27-81, Cl. D12-143.000.

Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., to Goodyear Tire & Rubber Company, The. Tire. 261,497, 10-27-81, Cl. D12-147.000.

Baus, Andre E. J., to Goodyear Tire & Rubber Company, The. Tire. 261,498, 10-27-81, Cl. D12-148.000.

Beckman Instruments, Inc.: *See*—
Lindsay, James R.; and Vedder, Gene D., 261,488, Cl. D10-78.000.

Benchmark Tool Company: *See*—
Irelan, Edward A., 261,519, Cl. D15-134.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,456, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,457, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Teller counter. 261,458, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Desk. 261,459, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Desk. 261,460, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,461, 10-27-81, Cl. D6-162.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,462, 10-27-81, Cl. D6-162.000.

Blumberg, Bert: *See*—
Butter, Ann F.; and Blumberg, Bert, 261,518, Cl. D15-118.000.

Boroda, Eli. Housing for an electronic stimulator. 261,551, 10-27-81, Cl. D24-41.000.

Boroda, Eli. Housing for an electronic stimulator. 261,552, 10-27-81, Cl. D24-41.000.

Bowman Construction Supply, Inc.: *See*—
Bowman, William E., 261,555, Cl. D25-74.000.

Bowman, William E., to Bowman Construction Supply, Inc. Expansion joint sealing strip for roadway joints and the like. 261,555, 10-27-81, Cl. D25-74.000.

Bridgestone Tire Company, Limited: *See*—
Suzuki, Norio; and Kojima, Hiroshi, 261,494, Cl. D12-146.000.

Brookfield Athletic Shoe Company, Inc.: *See*—
Landay, David L.; and Wolf, Alvan H., 261,542, Cl. D21-226.000.

Butler, James P., to Affiliated Hatch and Sunroof, Inc. Vehicle visor. 261,500, 10-27-81, Cl. D12-191.000.

Butter, Ann F.; and Blumberg, Bert. Barrier free drinking fountain. 261,518, 10-27-81, Cl. D15-118.000.

C-R-O. Inc.: *See*—
O'Donnell, Thomas P.; and Howery, James A., 261,476, Cl. D8-30.000.

Canon Kabushiki Kaisha: *See*—
Kando, Masahiro; and Shinkai, Hiroshi, 261,524, Cl. D16-44.000.
Sakai, Masaaki; and Hirose, Kunio, 261,528, Cl. D18-7.000.

Carbajales, Javier B. S.: *See*—
Carbajales, Jesus A. S.; and Carbajales, Javier B. S., 261,490, Cl. D11-158.000.

Carbajales, Jesus A. S.; and Carbajales, Javier B. S., to John J. Madison Company, Inc. Figurine of a basset hound. 261,490, 10-27-81, Cl. D11-158.000.

Carson, Billie R., to CBS Inc. Bridge assembly for guitars. 261,526, 10-27-81, Cl. D17-21.000.

Carson, Billie R., to CBS Inc. Bridge assembly for guitars. 261,527, 10-27-81, Cl. D17-21.000.

CBS Inc.: *See*—
Carson, Billie R., 261,526, Cl. D17-21.000.
Carson, Billie R., 261,527, Cl. D17-21.000.

Chambers, Richard F. Asphalt plant control house. 261,553, 10-27-81, Cl. D25-22.000.

Champion International Corporation: *See*—
Cottrell, Edward D.; and Robbins, Michael B., 261,516, Cl. D15-92.000.

Chandler, Marlene Y. Toilet tissue cover. 261,452, 10-27-81, Cl. D6-86.000.

Chisholm, James E., to MCC-Powers-Fiat. Modular shower stall. 261,548, 10-27-81, Cl. D23-57.000.

Cicerrella, Michael C. Game board. 261,536, 10-27-81, Cl. D21-20.000.

Citibank, N.A.: *See*—
Berman, James S.; and Stegmaier, Sigurd, 261,456, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,457, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,458, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,459, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,460, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,461, Cl. D6-162.000.
Berman, James S.; and Stegmaier, Sigurd, 261,462, Cl. D6-162.000.

Cobb, Richard E., to GTE Automatic Electric Labs. Inc. Wall mounted holder for a telephone set. 261,509, 10-27-81, Cl. D14-65.000.

Cody, Patrick D., to Innova Equipment Limited. Vacuum cleaner. 261,514, 10-27-81, Cl. D32-21.000.

Coilhose Pneumatics, Inc.: *See*—
Schenker, Michael, 261,501, Cl. D12-194.000.

Conner, James M.; and Ryan, James M., to Polaroid Corporation. Electronic flash or similar article. 261,523, 10-27-81, Cl. D16-42.000.

Container Corporation of America: *See*—
Darois, Roger E., 261,569, Cl. D34-39.000.

Cottrell, Edward D.; and Robbins, Michael B., to Champion International Corporation. Machine for dispensing and inserting sticks in comestibles. 261,516, 10-27-81, Cl. D15-92.000.

Cramer, Lyle L. Skateboard. 261,544, 10-27-81, Cl. D21-227.000.

Culbertson, Richard, to General Electric Company. Tape recorder and player or similar article. 261,506. 10-27-81, Cl. D14-6.000.

Darois, Roger E., to Container Corporation of America. Drum. 261,569, 10-27-81, Cl. D34-39.000.

Davis, Ralph L., to Payne, Wilbert A. Combined caddy for powdered products or the like and implements therefor. 261,568, 10-27-81, Cl. D28-77.000.

Delcroix, Guy, to Waterman S.A. Marking pen. 261,531, 10-27-81, Cl. D19-4.000.

Dickson, Thomas D., Jr. Foodstuff mill. 261,517, 10-27-81, Cl. D15-98.000.

DuBois, Arthur E. Reflector. 261,489, 10-27-81, Cl. D10-111.000.

Edson, Sydney, to Howard Displays, Inc. Counter display stand. 261,449, 10-27-81, Cl. D6-23.000.

Englishtown Sportswear, Ltd.: *See*—
Heinfling, Martin, 261,445, Cl. D2-25.000.

Envall, Bjorn E. A., to Saab-Scania Aktiebolag. Wheel. 261,502, 10-27-81, Cl. D12-211.000.

Escobedo, Antonio M.: *See*—
Havens, John H., 261,510, Cl. D14-65.000.

Ewert, Carl H. Spice rack. 261,455, 10-27-81, Cl. D6-130.000.

Fontaine, Jean F. L.: *See*—
Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., 261,497, Cl. D12-147.000.

Gauntt, William P. Tamper proof striker plate. 261,478, 10-27-81, Cl. D8-344.000.

General Bathroom Products Company: *See*—
Palka, James J.; and Rekart, Robert, 261,557, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, 261,558, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, 261,559, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, 261,560, Cl. D26-87.000.

General Binding Corporation: *See*—
Hausmann, Herbert H., 261,529, Cl. D18-34.000.
Hausmann, Herbert H., 261,530, Cl. D18-34.000.

General Electric Company: *See*—
Culbertson, Richard, 261,506, Cl. D14-6.000.
Kolwaite, John S., 261,512, Cl. D14-73.000.

Gillette Company, The: *See*—
Poisson, Norman D., 261,564, Cl. D28-48.000.

Goodyear Tire & Rubber Company, The: *See*—
Baus, Andre E. J.; and Pair, Robert E. L. A., 261,493, Cl. D12-143.000.
Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., 261,497, Cl. D12-147.000.
Baus, Andre E. J., 261,498, Cl. D12-148.000.
Hammond, Philip S., 261,491, Cl. D12-142.000.
Remy, Raymond M., 261,492, Cl. D12-143.000.
Remy, Raymond M., 261,496, Cl. D12-147.000.
Yurkovich, Charles G., 261,495, Cl. D12-146.000.

Graham, Elwood M.; and Polivka, John, to M. H. Graham Corporation. Food cutter. 261,472, 10-27-81, Cl. D7-155.000.

Grange, Kenneth H., to Wilkinson Sword Ltd. Razor handle. 261,565, 10-27-81, Cl. D28-48.000.

GTE Automatic Electric Labs. Inc.: *See*—
Cobb, Richard E., 261,509, Cl. D14-65.000.

H.I.T. Industries Ltd.: *See*—
Tawil, Abraham I., 261,535, Cl. D21-15.000.

Ham, Brian L.: *See*—
Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., 261,497, Cl. D12-147.000.

Hammond, Philip S., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 261,491, 10-27-81, Cl. D12-142.000.

Harada, Toshio: *See*—
Takahashi, Yoichi; Yamamura, Mashimichi; Harada, Toshio; and Inoue, Shigefumi, 261,468, Cl. D7-128.000.

Harper, Russell W., to Maryland Cup Corporation. Ice cream cone serving tray. 261,466, 10-27-81, Cl. D7-38.000.

Hass, William J. Radio receiver. 261,511, 10-27-81, Cl. D14-68.000.

Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,481, 10-27-81, Cl. D9-341.000.

Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,482, 10-27-81, Cl. D9-341.000.

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Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,485, 10-27-81, Cl. D9-341.000.

Hausmann, Herbert H., to General Binding Corporation. Combined punch and binding machine. 261,529, 10-27-81, Cl. D18-34.000.

Hausmann, Herbert H., to General Binding Corporation. Combined electric punch and binding machine. 261,530, 10-27-81, Cl. D18-34.000.

Havens, John H., to Escobedo, Antonio M. Telephone handset holder. 261,510, 10-27-81, Cl. D14-65.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,445, 10-27-81, Cl. D2-25.000.

Hirose, Kunio: *See*—
Sakai, Masaaki; and Hirose, Kunio, 261,528, Cl. D18-7.000.

Hobrecht, William, to New England Pottery Co. Potted plant hanger. 261,454, 10-27-81, Cl. D6-113.000.

Hollingsworth, Gene C., to Zero Corporation. Pin socket. 261,504, 10-27-81, Cl. D13-24.000.

Holmberg, Larry A. Adjustable plug for shotgun shell chamber. 261,545, 10-27-81, Cl. D22-7.000.

Homich, Richard D. Game board. 261,537, 10-27-81, Cl. D21-34.000.

Howard Displays, Inc.: *See*—
Edson, Sydney, 261,449, Cl. D6-23.000.

Howery, James A.: *See*—
O'Donnell, Thomas P.; and Howery, James A., 261,476, Cl. D8-30.000.

Hug, Niklaus, to Rommag P. Worwag & Co. Suction brush. 261,473, 10-27-81, Cl. D32-18.000.

Innova Equipment Limited: *See*—
Cody, Patrick D., 261,514, Cl. D32-21.000.

Inoue, Shigefumi: *See*—
Takahashi, Yoichi; Yamamura, Mashimichi; Harada, Toshio; and Inoue, Shigefumi, 261,468, Cl. D7-128.000.

Irelan, Edward A., to Benchmark Tool Company. Housing for a bench top band saw. 261,519, 10-27-81, Cl. D15-134.000.

Jenkins, Robert J. Portable seat. 261,450, 10-27-81, Cl. D6-26.000.

John J. Madison Company, Inc.: *See*—
Carbajales, Jesus A. S.; and Carbajales, Javier B. S., 261,490, Cl. D11-158.000.

Johnson, Lester L., Sr. Two-wheeled oil refiner dolly or the like. 261,520, 10-27-81, Cl. D15-150.000.

Johnson, Lester L., Sr. Oil refiner movable carriage or the like. 261,521, 10-27-81, Cl. D15-150.000.

Joseph, Clive E. Clothes pin. 261,474, 10-27-81, Cl. D32-61.000.

Kando, Masahiro; and Shinkai, Hiroshi, to Canon Kabushiki Kaisha. Grip for a cinecamera. 261,524, 10-27-81, Cl. D16-44.000.

Kohno Plastic Co., Ltd.: *See*—
Kohno, Yoshiharu, 261,487, Cl. D10-58.000.

Kohno, Yoshiharu, to Kohno Plastic Co., Ltd. Thermometer. 261,487, 10-27-81, Cl. D10-58.000.

Kojima, Hiroshi: *See*—
Suzuki, Norio; and Kojima, Hiroshi, 261,494, Cl. D12-146.000.

Kolwaite, John S., to General Electric Company. Clock radio or similar article. 261,512, 10-27-81, Cl. D14-73.000.

Koziol, Walter, to Modern Home Products Corp. Combined rotisserie motor and extended light. 261,469, 10-27-81, Cl. D7-129.000.

Koziol, Walter, to Modern Home Products Corp. Combined rotisserie motor and light. 261,470, 10-27-81, Cl. D7-129.000.

Koziol, Walter, to Modern Home Products Corp. Combined rotisserie motor and light. 261,471, 10-27-81, Cl. D7-129.000.

Kress, George: *See*—
Appel, Mel; and Kress, George, 261,541, Cl. D21-120.000.

Landay, David L.; and Wolf, Alvan H., to Brookfield Athletic Shoe Company, Inc. Integral shoe sole and wheel mounting for roller skate. 261,542, 10-27-81, Cl. D21-226.000.

Lee, Ernest, to Sunbeam Corporation. Hair dryer. 261,563, 10-27-81, Cl. D28-13.000.

Legerius, Bengt E. Cable channel shelf. 261,554, 10-27-81, Cl. D25-74.000.

Leisurecraft Products Ltd.: *See*—
Pardo, John, 261,508, Cl. D14-64.000.

Letourneau, Marc-Andre. Lighting fixture. 261,561, 10-27-81, Cl. D26-88.000.

Liebscher, Frank M. Key ring ornament. 261,448, 10-27-81, Cl. D3-65.000.

Lindsay, James R.; and Vedder, Gene D., to Beckman Instruments, Inc. Multimeter. 261,488, 10-27-81, Cl. D10-78.000.

Lowenthal, Jana. Combined cosmetic container and abrader. 261,480, 10-27-81, Cl. D9-314.000.

M. H. Graham Corporation: *See*—
Graham, Elwood M.; and Polivka, John, 261,472, Cl. D7-155.000.

Madl, Alfred W., to Sunbeam Corporation. Make-up mirror. 261,567, 10-27-81, Cl. D28-67.000.

Marks, Philip, to Advertising Displays Corporation. Combined shipping, storage and serving unit for bottles of wine or the like. 261,479, 10-27-81, Cl. D9-341.000.

Martin, Nick P. Simulative photo frame. 261,463, 10-27-81, Cl. D6-243.000.

Maryland Cup Corporation: *See*—
Harper, Russell W., 261,466, Cl. D7-38.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Takahashi, Yoichi; Yamamura, Mashimichi; Harada, Toshio; and Inoue, Shigefumi, 261,468, Cl. D7-128.000.

Mayuzumi, Masaki; and Yoshimura, Masaaki, to Tomy Kogyo Co., Inc. Pocket size game box. 261,534, 10-27-81, Cl. D21-10.000.

MCC-Powers-Fiat: *See*—
Chisholm, James E., 261,548, Cl. D23-57.000.

Means, Paul B., III: *See*—
Appel, Mel; and Means, Paul B., III, 261,540, Cl. D21-120.000.

Miller, Gerald K., to Nartron Corporation. Electrical control housing assembly. 261,505, 10-27-81, Cl. D13-32.000.

Minchew, Scott R. Serving bowl. 261,465, 10-27-81, Cl. D7-19.000.

Modern Home Products Corp.: *See*—
Koziol, Walter, 261,469, Cl. D7-129.000.
Koziol, Walter, 261,470, Cl. D7-129.000.
Koziol, Walter, 261,471, Cl. D7-129.000.

Morris, Leonard A., Sr. Skateboard. 261,543, 10-27-81, Cl. D21-227.000.

Muller, Richard B. Transmission detent cable connector. 261,513, 10-27-81, Cl. D15-5.000.

Nagley, Bruce K. Typing copy holder. 261,533, 10-27-81, Cl. D19-91.000.

Nartron Corporation: *See*—
Miller, Gerald K., 261,505, Cl. D13-32.000.

National Union Electric Corporation: *See*—
Schaefer, Harold W.; and Wiese, Martin E., 261,515, Cl. D32-23.000.

New England Pottery Co.: *See*—
Hobrecht, William, 261,454, Cl. D6-113.000.

O'Donnell, Thomas P.; and Howery, James A., to C-R-O, Inc. Welding gun. 261,476, 10-27-81, Cl. D8-30.000.
Olson, David V. Combination floss holder, key chain fob and dental appointment reminder. 261,566, 10-27-81, Cl. D28-64.000.
O'Reilly, Bryan. Combined lamp base and ball holder. 261,556, 10-27-81, Cl. D26-51.000.
Pair, Robert E. L. A.: *See*—
Baus, Andre E. J.; and Pair, Robert E. L. A., 261,493, Cl. D12-143.000.
Palka, James J.; and Rekart, Robert, to General Bathroom Products Company. Lighting fixture. 261,557, 10-27-81, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, to General Bathroom Products Company. Lighting fixture. 261,558, 10-27-81, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, to General Bathroom Products Company. Lighting fixture. 261,559, 10-27-81, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, to General Bathroom Products Company. Lighting fixture. 261,560, 10-27-81, Cl. D26-87.000.
Pardo, John, to Leisurecraft Products Ltd. Hand-held telephone. 261,508, 10-27-81, Cl. D14-64.000.
Parke, W. Rod. Air regulating nozzle. 261,547, 10-27-81, Cl. D23-34.000.
Patterson, Donald R. Pediatric examination table. 261,549, 10-27-81, Cl. D24-3.000.
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Davis, Ralph L., 261,568, Cl. D28-77.000.
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Smith, Ernest L., 261,486, Cl. D9-452.000.
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Haubert, Carol A., 261,485, Cl. D9-341.000.
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Palka, James J.; and Rekart, Robert, 261,557, Cl. D26-87.000.
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Robbins, Michael B.: *See*—
Cottrell, Edward D.; and Robbins, Michael B., 261,516, Cl. D15-92.000.
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Hug, Niklaus, 261,473, Cl. D32-18.000.
Ryan, James M.: *See*—
Conner, James M.; and Ryan, James M., 261,523, Cl. D16-42.000.
Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 261,550, Cl. D24-9.000.
Ryder International Corporation: *See*—
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Shaffer, Frank E. Cable or rivet cutter. 261,477, 10-27-81, Cl. D8-98.000.
Shinkai, Hiroshi: *See*—
Kando, Masahiro; and Shinkai, Hiroshi, 261,524, Cl. D16-44.000.
Shu, David F., to TDS, Inc. C.A.T.V. Signal splitter. 261,503, 10-27-81, Cl. D13-11.000.
Sides, James E. Aerial toy. 261,538, 10-27-81, Cl. D21-86.000.
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Smith, Allan B. Combination beach towel-carry bag. 261,464, 10-27-81, Cl. D6-265.000.
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Stegmaier, Sigurd: *See*—
Berman, James S.; and Stegmaier, Sigurd, 261,456, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,457, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,458, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,459, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,460, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,461, Cl. D6-162.000.
Berman, James S.; and Stegmaier, Sigurd, 261,462, Cl. D6-162.000.
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Lee, Ernest, 261,563, Cl. D28-13.000.
Madl, Alfred W., 261,567, Cl. D28-67.000.
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Tomy Kogyo Co., Inc.: *See*—
Mayuzumi, Masaki; and Yoshimura, Masaaki, 261,534, Cl. D21-10.000.
Tabata, Toshinori, 261,532, Cl. D19-64.000.
Uniroyal GmbH: *See*—
Schmohl, Michael W., 261,446, Cl. D2-309.000.
Vedder, Gene D.: *See*—
Lindsay, James R.; and Vedder, Gene D., 261,488, Cl. D10-78.000.
Viio, Matti. Workman's vest. 261,447, 10-27-81, Cl. D2-190.000.
Warner-Lambert Company: *See*—
Thorpe, Donald, 261,483, Cl. D9-342.000.
Waterman S.A.: *See*—
Delcroix, Guy, 261,531, Cl. D19-4.000.
Wiese, Martin E.: *See*—
Schaefer, Harold W.; and Wiese, Martin E., 261,515, Cl. D32-23.000.
Wilkinson Sword Ltd.: *See*—
Grange, Kenneth H., 261,565, Cl. D28-48.000.
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Yoshimura, Masaaki: *See*—
Mayuzumi, Masaki; and Yoshimura, Masaaki, 261,534, Cl. D21-10.000.
Younger Manufacturing Company: *See*—
Rips, Irving, 261,525, Cl. D16-115.000.
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Hollingsworth, Gene C., 261,504, Cl. D13-24.000.

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Mikkelsen, James C.; and Van den Berg, Cornelis P., 4,781, Cl. 68.000.
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Mikkelsen, James C.; and Van den Berg, Cornelis P., 4,781, Cl. 68.000.
Yoder Brothers, Inc.: *See*—
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 27, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

114	4,296,497
115	4,296,498
239	4,296,499

CLASS 3

1.7	4,296,500
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253	4,296,504
324	4,296,505
480	4,296,506
524	4,296,507
540	4,296,508

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450	4,296,510

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412	4,297,098
484	4,297,099
527	4,297,100
531	4,297,101
534	4,297,103

CLASS 9

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CLASS 10

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CLASS 12

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142 LC	4,296,515
142 R	4,296,514

CLASS 14

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CLASS 15

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250.32	4,296,520
	4,296,521
250.36	4,296,522
415 R	4,296,523

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150	4,296,524
174	4,296,525

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CLASS 19

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255	4,296,528

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230 HC	4,297,106
230 R	4,297,105

CLASS 24

30.5 P	4,296,529
200	4,296,531
206 R	4,296,532
216	4,296,533
270	4,296,534
295	4,296,530

CLASS 28

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CLASS 29

1.3	4,296,536
116 AD	4,296,537
156.4 R	4,296,538
157.3 A	4,296,539
460	4,296,540
568	4,296,541
574	4,296,542
596	4,296,543
598	4,296,544
602 R	4,296,545
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766	4,296,547
871	4,296,548
874	4,296,549
884	4,296,550

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183	4,296,552
381	4,296,553

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CLASS 34

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107	4,296,556

CLASS 36

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136	4,296,559

CLASS 38

77.81	4,296,560

CLASS 40

158 R	4,296,561
438	4,296,562
518	4,296,563

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66	4,297,110

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73	4,296,569

CLASS 49

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CLASS 51

32	4,296,571
170 TL	4,296,572

CLASS 52

6	4,296,573
27	4,296,574
66	4,296,575
90	4,296,576
187	4,296,577
200	4,296,578
239	4,296,579
281	4,296,580
520	4,296,581
590	4,296,582
717	4,296,583
742	4,296,584
745	4,296,585
787	4,296,586
788	4,296,587

CLASS 53

86	4,296,588
300	4,296,589
531	4,296,590

CLASS 55

92	4,297,111
195	4,297,112
213	4,297,113
299	4,297,114
302	4,297,115
319	4,297,116
389	4,297,117

CLASS 56

10.3	4,296,591
14.4	4,296,592
98	4,296,593
336	4,296,594
341	4,296,595
	4,296,596

CLASS 57

205	4,296,597
284	4,296,598

CLASS 60

39.23	4,296,599
39.28 R	4,296,600
224	4,296,601
398	4,296,602
528	4,296,603
562	4,296,604
599	4,296,605
754	4,296,606

CLASS 62

6	4,296,607
	4,296,608
55	4,296,610
89	4,296,611
123	4,296,612
514 R	4,296,609
515	4,296,613

CLASS 65

104	4,297,118
141	4,297,119
281	4,297,120
348	4,297,121

CLASS 69

48	4,296,614

CLASS 70

19	4,296,615
34	4,296,616
63	4,296,617
358	4,296,618
451	4,296,619

CLASS 71

12	4,297,122
58	4,297,123
66	4,297,124
77	4,297,125
78	4,297,126
88	4,297,127
92	4,297,128
93	4,297,129
119	4,297,130

CLASS 72

100	4,296,620
130	4,296,621
208	4,296,622
227	4,296,623
308	4,296,624
345	4,296,625
392	4,296,626

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15 R	4,296,627
28	4,296,628
116	4,296,629
304 C	4,296,630
356	4,296,631
362 AR	4,296,632
	4,296,633
730	4,296,635
861.12	4,296,636
863.11	4,296,637
863.21	4,296,638
864.86	4,296,634

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5.46	4,296,639
422	4,296,641
475	4,296,642
531	4,296,643
606 R	4,296,644
688	4,296,645
	4,296,646
690	4,296,647
751	4,296,649
	4,296,650
798	4,296,648
868	4,296,652
869	4,296,651

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1 T	4,297,131
10 V	4,297,132
53	4,297,133
118 R	4,297,134
123 B	4,297,135
206	4,297,136

CLASS 81

3.46 R	4,296,653
57.26	4,296,654
405	4,296,655
429	4,296,656

CLASS 82

1 C	4,296,657
30	4,296,658

CLASS 83

54	4,296,659
100	4,296,660
796	4,296,661
880	4,296,662

CLASS 84

1.01	4,296,663
1.03	4,296,664
	4,296,665
1.26	4,296,666
345	4,296,667
383 R	4,296,668

CLASS 89

1.816	4,296,669
43 R	4,296,670

CLASS 91

5	4,296,671
271	4,296,672
375 A	4,296,673
391 R	4,296,674
396	4,296,675
417 R	4,296,676
510	4,296,677

CLASS 92

13.1	4,296,678
52	4,296,679
98 D	4,296,680
122	4,296,681

CLASS 99

426	4,296,682

CLASS 100

53	4,296,683
292	4,296,684

CLASS 102

218	4,296,688
260	4,296,689
387	4,296,685
427	4,296,686
518	4,296,687

CLASS 104

91	4,296,690

CLASS 105

370	4,296,691
397	4,296,692

CLASS 106

15.05	4,297,137
18.18	4,297,138
197 C	4,297,144
308 Q	4,297,145

CLASS 108

28	4,296,693
116	4,296,694

CLASS 111

34	4,296,695

CLASS 112

70	4,296,696
109	4,296,697
110	4,296,698
121.15	4,296,699
153	4,296,700
168	4,296,701
258	4,296,702
310	4,296,703

CLASS 114

103	4,296,704
219	4,296,705
294	4,296,706

CLASS 116

58 A	4,296,707

CLASS 118

233	4,296,708

CLASS 119

1	4,296,709
51.11	4,296,710

CLASS 122

22	4,296,711
	4,296,712
32	4,296,713

CLASS 123

53 B	4,296,714
90.15	4,296,715
195 A	4,296,717
195 C	4,296,716
198 D	4,296,718
198 F	4,296,719
309	4,296,720
407	4,296,721
492	4,296,722
510	4,296,723
568	4,296,724

CLASS 124

24 R	4,296,725

CLASS 126

25 B	4,296,726
116 A	4,296,727
376	4,296,728
421	4,296,729
	4,296,730
424	4,296,731
426	4,296,732
428	4,296,733
431	4,296,734
438	4,296,735
	4,296,736
	4,296,737
443	4,296,738
444	4,296,739
448	4,296,740
449	4,296,741
450	4,296,742

CLASS 127

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80 C	4,296,744
80 G	4,296,761
156	4,296,745
201.15	4,296,746
220	4,296,747
276	4,296,748
283	4,296,749
287	4,296,750
325	4,296,751
635	4,296,752
660	4,296,753
694	4,296,754
705	4,296,755
716	4,296,756
721	4,296,757
728	4,296,758
766	4,296,759
788	4,296,760

CLASS 131

359	4,296,762

CLASS 132

7	4,296,763
	4,296,764
53	4,296,765
73	4,296,766

CLASS 134

3	4,297,148
7	4,297,147
15	4,296,767
47	4,296,768
68	4,296,769

CLASS 136

248	4,297,521
256	4,297,391

CLASS 137

62	4,296,770
110	4,296,771
269.5	4,296,772
312	4,296,773
322	4,296,774
	4,296,775
340	4,296,776
351	4,296,777
433	4,296,778

CLASS 138

38	4,296,779
40	4,296,780
155	4,296,781

CLASS 139

65	4,296,782
302	4,296,783

CLASS 140

92.2	4,296,784

CLASS 141

105	4,296,785
309	4,296,786

CLASS 148

1.5	4,297,149
6.3	4,297,150
9 R	4,297,151

CLASS 149

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CLASS 150

52 G	4,296,787
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CLASS 152

209 R	4,296,789
354 R	4,296,790

CLASS 156

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79	4,297,154
86	4,297,155
93	4,297,156
164	4,297,157
305	4,297,158
307.7	4,297,159
331.1	4,297,160
583.3	4,297,161
643	4,297,162

CLASS 159

48 R	4,297,163

CLASS 160

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332	4,296,792

CLASS 162

60	4,297,164

CLASS 164

24	4,296,793
131	4,296,794

CLASS 165

27	4,296,795
46	4,296,796
48 S	4,296,797
56	4,296,798
74	4,296,799
95	4,296,800
104.17	4,296,801
110	4,296,802
	4,296,803
133	4,296,804
151	4,296,805

CLASS 166

120	4,296,806
184	4,296,807
191	4,296,808
259	4,296,809
265	4,296,810
273	4,296,811
274	4,296,812
293	4,296,813
303	4,296,814

CLASS 169

37	4,296,815
	4,296,816
62	4,296,817

CLASS 171

63	4,296,818

CLASS 173

147 4,296,819

CLASS 174

27 4,297,523
36 4,297,522
48 4,297,524
58 4,297,525
102 R 4,297,526

CLASS 175

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87 4,296,821
249 4,296,822
308 4,296,823
340 4,296,824
410 4,296,825

CLASS 179

1 PC 4,297,529
1 SB 4,297,528
1 VC 4,297,527
2 C 4,297,530
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18 AB 4,297,532
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90 D 4,297,534
156 R 4,297,535
170 D 4,297,536
180 4,297,537
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189 D 4,297,539

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CLASS 181

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121 4,296,828
129 4,296,829
208 4,296,830
224 4,296,831
255 4,296,832

CLASS 182

2 4,296,833
155 4,296,834
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193 4,296,836

CLASS 184

15 R 4,296,837
106 4,296,838

CLASS 188

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73.43 4,296,843
341 4,296,845
378 4,296,839

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35 4,296,848
61 4,296,849
64 4,296,850
84 C 4,296,851
104 B 4,296,852
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4,296,854

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514 4,296,856

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5 E 4,297,541
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330 4,297,556

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CLASS 204

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386 4,296,860
428 4,296,861
439 4,296,862
504 4,296,863

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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04 : 4,296,731
4,297,542
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